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THE DISTINCTION BETWEEN MAN AND ANIMALS.

"Les animaux ne diffèrent de l'homme que du plus au moins."

CONDILLAC, *Traité des Animaux*, ii, 4.

EVEN upon the free admission of the most eminent and candid supporters of Mr. Darwin, we are not yet compelled to accept as *proved* the Darwinian hypothesis of gradual development. But all calm and earnest inquirers ought to express their complete dissent from the methods usually adopted in order to overthrow it. When it was first propounded, the clergy in general, and even philosophers raised a cry, as though an attempt had been made to attack humanity in its inmost shrine of sacredness; and though they had never seen an ape in their lives, except perhaps in the cage of a menagerie, they mounted their highest horses and declaimed indefinitely about Intellect, Soul, Understanding, and Self-consciousness, and all other immanent qualities of mankind, according to the names they receive after being reflected in this or the other philosophical prism.* All this is beside the question, which affects the organism alone; and certainly, as may easily be shewn, neither the past pedigree nor the future destinies of the human body until the resurrection, are such as to make any man consider it a degradation that the particles which form his mortal body should have been vivified during past ages in the material

* See Vogt, *Vorlesungen über den Menschen*, § 9. In his second part, which only appeared after this was written, he has examined the question at length. It will be observed that I have not paused to notice such definitions as that "man is a tool-using animal", "a cooking animal", etc. If they were true, they would furnish us with no real line of demarcation. But are they true? Can the Tartar, who uses his beefsteak as a saddle before he eats it, be said to cook? And if so, may not the racoon be said to cook, when it dips its food in water? And do not monkeys use cocoa-nuts, boughs of trees, etc., as tools? "The use of fire," says Bernardin de St. Pierre, "places an infinite distance between men and animals" (*Harm. de la Nature*). But the Dokos, and probably other savages, do not know the use of fire: and similarly, on one side or other, all such definitions break down.

structure of inferior animals. The supposition is not *proved*, and we believe it to be untrue; but it has been opposed on false grounds. It is not degrading to man, it is not against the majesty of God. "It is just as noble a conception of the Deity," says Mr. Darwin, "to believe that he created a few organic forms capable of self-development into other needful forms, as to believe that He required a fresh act of creation to supply the void caused by the action of His laws."

That man is to be classed as a member of the animal kingdom, and not as zoologically distinct from it, is now admitted, although there was a great outcry against Linnæus, when he first gave to the fact a scientific recognition. "Not being able," says Professor Owen, "to appreciate or conceive the distinction between the psychical phenomena of a chimpanzee and of a Boschisman, or of an Aztec with arrested brain growth, as being of a nature to exclude comparison between them, or as being other than a difference of degree, I cannot shut my eyes to the significance of that all-pervading similitude of structure—every tooth, every bone, strictly homologous—which makes the determination of the difference between homo and pithecus the anatomist's difficulty. And, therefore, with every respect for the author of the *Records of Creation*, I follow Linnæus and Cuvier in regarding mankind as a legitimate subject of zoological comparison* and classification."

M. Flourens has most emphatically observed† "Un intervalle profond, sans liaison, sans passage, sépare l'espèce humaine de toutes les autres espèces. Aucune autre n'est voisine de l'espèce humaine, aucun genre même, aucune famille." That there is between man and animals an enormous difference in *degree*, no one dreams of denying. As Buffon says, "Le plus stupide des hommes suffit pour conduire le plus spirituel des animaux, il le commande et le fait servir, et c'est moins par force et par adresse que par supériorité de nature, et parce-qu'il a un projet raisonné, un ordre d'actions et une suite de moyens par lesquels il contraint l'animal à lui obéir."‡ But when we pass from differences of *degree* to differences of *kind*,§ it becomes very difficult, if not impossible, to point out any satisfactory, definite, and pre-

* On the Character of the Class Mammalia, p. 20, n., Mem. of British Association, 1857.

† Éloge de Blumenbach, Mém. de l'Institut, t. xxi. Linnæus, on the other hand, whose *Homo Lar* is the grand gibbon of Buffon, calls man "*homo sapiens*", and the chimpanzee (for clearly his description must refer to the chimpanzee) "*homo troglodytes*". Both Rousseau and Burnet considered oranges to be men. See Godron, ii, 117.

‡ Hist. Nat., ii, 438. See Aug. Carlier, De l'esclavage, p. 11, seq.

§ Even Porphyry thought that animals differ from man in *degree* only, not in essence. De Abstinencia. See Pouchet, De la Plur. de Races Hum., ch. ii.

cise line of demarcation between the human race and inferior animals. The difference, in other words, is quantitative, and not, so far as we can yet see, essentially qualitative.

Let us very briefly examine some of the suggested differences between them, passing over all those more trifling ones which, even if they were established, would not amount to an essential and generic difference. The examination is all the more necessary, because few subjects have been more disguised than this by ignorance and prejudice and their invariable concomitants, arrogant assertion and obstinate refusal to observe the facts.

1. Buffon says, "Whatever be the resemblance between the Hottentot and the ape, the interval which separates them is immense, since it is filled up interiorly by Thought*, and exteriorly by Language." "The plant," says Is. Geoff. St. Hilaire, "lives; the animal lives and feels; the man lives, feels, and thinks."

Yet it is impossible, as even Buffon admits, to refuse to allow to animals at least an analogon of thought, or, as M. de Quatrefages expresses it, a rudimentary intelligence. To prove this would be to copy out whole volumes of authentic narratives respecting various animals. Dr. Yvan, in his account of a tame orang of Borneo, mentions that one day he took a little girl, examined her in the most attentive physiological manner with the greatest gentleness, and then retiring into a corner, with a most puzzled expression, meditated for a considerable time. A dog, which is searching for its master, will come to a place where three roads meet, and after smelling at two of them will take the third *without stopping to trace the scent*, because an exhaustive and perfect syllogism has proved to him that it is unnecessary to do so. Borlase† narrates to us that he once saw a lobster trying to get an oyster. Everytime, however, the lobster tried to insert its claw the oyster closed its shell and frustrated the attempt; at last the lobster picked up a little pebble and when next the oyster opened its shell dropped it in, and so attained his object. The necrophorus in order to get at a dead animal at the top of a stick, will *undermine* the stick and so bring the animal down. Streud's cat, when it began to feel the exhaustion of air in his air-pump, would put its paw over the valve and so stop its action. An elephant was seen to pick up a six-pence which was beyond his reach by blowing it violently against the wall until it had recoiled within the length of his trunk. Cuvier tells us that, when a rope was shortened with knots in order to prevent the orang-outang at Paris from letting itself down to unlock a door, the

* Hence the very root of the word man, Sanskr. *manudscha*, Goth. *manniska*, Germ. *mensh*, etc., is "man", to think. Grimm, *Ueber d. Urspr. d. Sprache.*, § 121.

† See Thompson's *Passions of Animals*.

creature observing that his weight only drew the knots tighter, climbed up *above* them, and so untied them.

After these cases, which might be *indefinitely* multiplied, who shall deny Thought even to a crustacean? who will venture to say with Descartes,* "la bête n'est qu'un automate, une pure machine?" or, who will refuse to admit with Milton respecting animals that—

"They also know,
And reason, not contemptibly";

and with Dr. Brown that they exhibit the evident marks "of reasoning—of reasoning which I cannot but think as unquestionable as the instincts that mingle with it." The instincts of animals adapt themselves to varying circumstances, and therefore Coleridge† rightly concludes that their instinctive intelligence "is not different in kind from understanding, or the faculty which judges according to sense in man."

The definition of man, then, as a "reasonable animal," and the attempt to establish a generic difference between that which in animals is called "instinct," and in man "reason," falls to the ground. Instinct, as Comte‡ pointed out, is "a spontaneous impulse in a determinate direction, independent of any foreign influence; and, therefore, there is instinct in man as much or more than in brutes." If, on the other hand, intelligence be defined as the aptitude to modify conduct in conformity to the circumstances of the case—which is the main practical attitude of reason proper—it is more evident than before that the difference between men and animals is only in degree of development. Comte considers that this perversion of the word instinct is a remnant of the automatic hypothesis of Descartes; and in a few pregnant remarks he shows the truth of that which has also been stated by Professor Huxley§, that "the essential processes of reasoning are exerted by the higher order of brutes as completely and effectively as by ourselves." The ideal|| fixity of instinct, which is

* Des Cartes, *Disc. de la Méthode*, ed. Cousin, i, 184-190.

† *Aids to Reflection*, i, 193, sixth edition. Sidney Smith a little understates matters when he says "I feel myself so much at ease about the superiority of mankind; I have such a marked and decided contempt for the understanding of every baboon I have ever seen, I feel so sure that the blue ape without a tail will never rival us in painting, poetry, or music, that I see no reason whatever why justice may not be done to the few fragments of soul and tatters of understanding which they may really possess." This passage is exquisitely humorous, but it rather tends to conceal the *real nature* of the serious question, What is the distinguishing mark between men and animals?

‡ Comte, *Phil. Pos.*, v, 6; Martineau's trans., i, 465. Dr. Darwin long ago saw the same truth. *Zoonomia*, i, 256.

§ Huxley, *Lectures*, p. 57. See, too, Lyell's *Antiquity of Man*, p. 405.

|| Even F. Cuvier (*Dict. des Sciences Nat.*, xxiii, 532), Flourens (*De l'Instinct et de l'Intelligence des Animaux*), and Godron (*De l'Espèce*, ii, 131), appear to endorse this positive error as to the unalterableness of instinct. Instinct is no

supposed to characterise animals, is, as Leroy has proved, the mere error of inattentive observers; and instead of patiently exploring the moral and intellectual nature of animals, men have jumped at once to a contemptuous and erroneous opinion which has blinded their eyes to innumerable facts. Man has looked at the animals only through* the deceitful prism of his own pride, and his own unreasoning individuality.

2. Nor, again, can we deny to animals a species of *language*, or *διὰλεκτος*, as Plato calls it, although Max Müller considers language a Rubicon which animals can never cross. It is true that the language may be rudimentary, and mainly composed of interjections; it is true it may be the expression of mere feeling,† rather than of free intelligence, yet it differs from human speech neither in its mechanical production nor in its object and results.‡ To prove this was the object of several of those books§ which were written to refute the wonderful automaton-theory of Descartes. To all intents and purposes animals *do* possess language, and some of them even a power of articulation, which may be proved by many anecdotes. When bees have lost their queen the first that discovers the fact informs the whole hive by crossing and tapping the antennæ of all which it meets. Dr. Franklin found some ants eating treacle. He shook them out, and hung the pot by a string from the ceiling. Only one ant had been left in the pot. This crawled up the string, across the ceiling, and down the wall, and then informed the rest who immediately thronged to the treacle till it was all devoured. A surgeon at Leeds bandaged and cured the leg of a dog which had been lamed. The dog attended every day till it was cured, and after three months brought with it another lame dog to request the same assistance. "Parrots," says Archbishop Whately, "can be taught not only to pronounce words, but to pronounce them with some general meaning of what they utter." "All ears," says Professor Wilson, "can correspond to the cultivated utterances of domestic animals, and especially to the varying tones of the dog. Its whine, its bay, its whimper, its bark, its yelp, its growl, its snarl, its snap, its howl, are

more unalterable in animals than it is in man. That animals have *intelligence*, as well as *instinct*, has been admitted by Locke, *Essay on Underst.*, ii, 11, Leibnitz, *Nouv. Essais*, ii, 16, Condillac, *Traité des Animaux*, p. 36, Leroy, *Lettres Philosophiques*, p. 5, etc. Réaumur, etc. (quoted by Godron, *l.c.*), as well as by the authorities already adduced. For some good remarks on *instinct*, see Dr. Whewell, *Hist. of the Ind. Sciences*, i, 615, seq.

* Cornay, *Anthrop.*, p. 16.

† Heyse, *Syst. der Sprachwissenschaft*, 25-33.

‡ De Quatrefages, *loc. cit.*

§ Such as those of Fabr. de Aquapendente, and of Drechseler, and of Rechtenbach, *De Sermone Brutorum*; Crocius (1676), and Klemm (1704), *De Animâ Brutorum*; J. Stahl, *Logice Brutorum*, Hamb., 1697; Le Père Bonjeant, *Amusements Phil. sur le Langage des Bêtes*, La Haye, 1739, etc.

each distinct utterances, and every one of these names is a word directly derived from this dog-language." A dog can easily understand his master, and Gall humorously remarks that his dog knew English, French, and German, having acquired the latter with great rapidity. So too a master "can tell from the tone of a dog's bark, when it is greeting an acquaintance, threatening an intruder, repelling a beggar, or whether it is only indulging in that liberty of speech which is the birthright of every civilised dog, and taking an abstract bark at things in general."* We conclude, then, with Archbishop Whately† that "Man is *not* the only animal that can make use of language to express what is passing within his mind, and can understand, more or less, what is so expressed by another."

3. Nor, again, does the possession of a *power of abstraction*, as Locke‡ supposed, furnish any generic difference between man and brute. In the first place, there are many savage tribes among whom the power of abstraction can be barely said to exist at all, or only in the feeblest measure. The Iroquois§ have no generic word for "good;" the Mohicans no verb for "I love;" the Chinese no word for "brother;" the Malay no word for "tree" or for "colour;" the Australians no word for "bird;" the Esquimaux no word for "fishing;" though each of these languages has a host of specific words for each separate kind of tree, bird, fish, &c. Then again, conversely, who has ever proved that beasts have no power of abstraction? no conception, for instance, of the generic "man," or of "colour," or of "whiteness?" What right have we to base a distinction on an assumption so completely unproven? And if, putting the remark in a slightly different form, we say with Plato|| that man is the only animal who counts, we are again confronted by the facts that many savage nations have only the feeblest conception of number, and cannot count beyond three or four; while, on the other hand, the more intelligent animals frequently act in a manner

* Prehistoric Man, i, 83. There is even reason to believe that barking is an acquired language (Rev. de Deux Mondes, Fevr. 1861). Pritchard, Nat. Hist. of Man, p. 83, ed. Norris.

+ On Instinct, Dublin, 1847. Even Lucretius saw that practically a dog can speak (v, 1048).

‡ Essay on the Human Understanding, II, xi, 10, quoted and approved by Max Müller, Lectures, p. 342. M. Holland denies to animals all conception of time and space (De l'Homme, p. 78). What is the value of such an assertion as this? Such was also the view of Ballanche, "La Faculté d'abstraire a été refusée à la bête", Palingénésie, p. 175; and of Bonnet, "Les Animaux ne généralisent point leurs idées", Princ. Phil., v, 2. See Charma, Sur le Lang., p. 190.

§ See Farrar, Origin of Lang., pp. 47, 107; Crawford, Malay Dict., i, 68, seq.; Latham, Var. of Man, p. 376; De Quatrefages, Rev. de Deux Mondes, Dec. 15, 1860; Maury, La Terre et l'Homme, p. 433; Du Ponceau, Gram., p. 120, etc.

|| Epinosis. Plato's other point of difference (Legg., ii) that man is the only animal that dances and sings, is not true, and if it were would be insignificant.

which shows that they are not without this rudimentary sense of numerical relations.

4. Nor, certainly, does man differ from animals in *anatomic structure*, as Helvetius* asserted. On the contrary, anatomy "has proved an absolute identity of anatomic composition—bone for bone, muscle for muscle, vessel for vessel, nerve for nerve. Some variations of volume, of dimension, of arrangement in harmony with the exterior forms, constitute almost the only differences. In proportion as the means of investigation have become more numerous and more powerful, the approach has become more close;" and chemistry, and physiology, even when they work with the microscope, carry the identity still farther than anatomy.† To find some real essential point of difference between the structure of man and of the ape, has been called the main difficulty of the anatomist; and Linnæus, who was always straightforward and honest, said long ago, "Nullum characterem hactenus eruere potui unde homo a simia internoscatur."

5. Nor, again, does the difference consist in man's *vertical† position*, which penguins and some ducks share with him; to say nothing of the frequency with which that position is assumed by the higher apes.

6. Nor yet, again, in *affections,‡ passions, and the faculties of the heart*. On the contrary, animals closely resemble men in moral character. They love, hate, attend to their offspring, have permanent feuds and fast friendships, are clever and stupid, profit or fail to profit by education, and show most decided individuality. We have all known affectionate, grateful, and caressing dogs, as well as surly, jealous, misanthropic, passionate dogs; conceited dogs and humble dogs, gentlemanly dogs and rude dogs. Nay, more; the most decided differences of character may be at any time observed in a single flock of chickens. Some of them are greedy, and others selfish; some of them generous, and others mean; some brave, and others cowardly; some of them lively, and others morose.

7. Nor, again, is it in the *expression§ of emotions*. Milton, indeed, speaks of the

* Helvetius, De l'Esprit, i, 1, note a. "L'organisation de la bête est de beaucoup inférieure à la nôtre."

† Godron, De l'Espèce, ii, 112; De Quatrefages, l. c. Dec. 1860, p. 825. Compare Vogt, Vorlesungen, § 145, who places side by side a human brain and one of a chimpanzee, adding "Man vergleiche und staune!" On the whole subject, see Huxley, Lectures, p. 6; Cornay, De l'Unité, p. 16; Godron, ii, 110-139; Charma, Ess. sur la Langage, 30, 189; Lyell, Ant. of Man, p. 493; Hollard, 78-86.

‡ De Quatrefages, l. c. See, too, Maupertuis, Sur l'âme des Bêtes, Amsterd. 1728.

§ See the quotation from Grant and Lawrence in Pouchet, De la Plur., ch. ii.

"Smile which from reason flows,
To brute denied."

But the orang "is capable of a kind of laugh when pleasantly excited," and it is certain that there are other animals which both laugh and cry.

8. Nor does it consist, as so many philosophers* have asserted rather than proved, in *self-consciousness*. "Les animaux," says M. Flourens, "sentent, connaissent, pensent; mais l'homme est le seul de tous les êtres créés à qui ce pouvoir ait été donné de sentir qu'il sent, de connaître qu'il connaît, et de penser qu'il pense." But how can this be proved? Animals, certainly, have an individualised † perception, a *sensorium commune*; they are certainly as conscious as man is of their own material being; and although Comte truly says that we shall never know what goes on in an animal's brain, yet it requires no wonderful knowledge to be sure that any individual cat (for instance), though it may not be able to say "I," is not in the habit of mistaking itself for any other cat! The individuality of animals is often as intense and energetic as that of men; and if conceit, pride, and shyness be signs of self-consciousness, it must exist in some animals to a very remarkable extent.

9. Nor does *perfectibility*, or "improveable reason," constitute a difference. "L'animal ne progresse pas," says Buffon, ‡ "l'homme est perfectible." Both propositions are questionable. Some animals *can* be educated, can be improved in sagacity, and trained into a thousand useful and cleanly habits; in other words, they are capable of progress and growth in intelligence; as, for instance, in the case of the dog, as every one is aware who has ever trained or observed one! And, on the contrary, some men show the gift of perfectibility to a very slight degree, and evince, as has been abundantly proved, a deeply-seated inaptitude for real civilisation, which excludes the application of the word "perfectibility" to them, except in a sense in which it may also be applied to the more intelligent animals. ‡

10. Nor, again, does the difference consist in the possession of *moral perceptions*. Aristotle was demonstrably mistaken in saying § that man alone has the sentiment of good and evil, of justice and injustice. Animals show all the virtues and all the vices. They|| are

* Die intellectuelle Anlage, und die Fähigkeit der Selbstbetrachtung, deren das thier unfähig ist. Burmeister, Gesch. d. Schöpfung, § 406, etc.

† Pouchet, l. c.; Comte, Philos. Pos., v, ch. 6.

‡ Buffon, Introd. à l'Hist. de l'Homme. So, too, Archbp. Sumner, Records of Creation, ii, 2.

§ Aristotle, Polit., i, 2.

|| Zimmermann, Der Mensch., § 46.

faithful, obedient, attached, good-natured, grateful; and, on the other hand, they are false, revengeful, obstinate, artful. And, as a necessary consequence of this, they clearly possess a *conscience*. What careful observer of animals has not noticed the misery of a dog who goes about with a guilty conscience? He knows as well as possible that he has done wrong, and betrays by his motions that he is penitent and ashamed. And even if this were not so—if animals betrayed *no* sense of morality—are there not men, tribes and nations of men, of whom the same is true? Is it necessary to pause, even for a moment, to prove that there have been even civilised nations whose notions of morality were so confused, or so obliterated, as to cause them to regard with approval or indifference suicide and murder, adultery and theft?

11. Again, animals display powers of memory and of will. They can and do profit by experience. They have a sense of playfulness exhibited in a way which shows the influence of imagination; they act in a manner which often proves distinct recognition of the relation between cause and effect; some of their actions are marked by hypocrisy and deceitfulness; sometimes they have been known to exercise remarkable powers of invention; they frequently show themselves able to compute time, and sometimes manifest a sense of number; their astonishment and their sympathy are often expressed as clearly as though they had articulate utterance. These are not assertions, but facts; nor are they founded on doubtful stories in Pliny and Ælian*, but on well-authenticated cases, for which I refer the curious reader to the excellent book of Mr. Thompson on the *Passions of Animals*; a book which will afford him the strongest possible confirmation of every argument which we have here adduced.

12. Does the difference, then, consist in a *sense of religion*? This is the conclusion of M. de Quatrefages, who would define man, in his distinction from the brute, as “an organised being, living, feeling, moving spontaneously, endowed with morality and a sense of religion (religiosité).” We have seen that “morality” may be struck out of this definition; nor is “religiosity” at all a satisfactory criterion. If animals are not insensible to the broad outlines of the moral law, can we deny them that (of course rudimentary) sense of religion, which perhaps can only exist in the union of the intellectual faculties with a sense of right and wrong. Is there, at any rate, any proof, or shadow of proof, that it does not exist in *some* animals? Is there, again, any proof, or shadow of proof, that it exists in any higher degree in *all* men? Religion among some tribes seems to resolve itself into a

* See Pliny, viii, 30; Solinus, vii, xl; Ælian, iii, 10, vii, 22, xvi, 15, xvii, *passim*; Michaelis, De Origine Linguae, p. 140. seq.; Vogt, Vorlesungen, § 255.

mere dread of the unknown; and this exists among the more intelligent animals, especially, as has been noticed so frequently, in the horse and the dog. A dog in the possession of Professor Vogt's father exhibited the liveliest terror at the presence of a ghost in the shape of a phosphorescent tree.

13. I have not entered on the question whether animals have a *soul*; and probably, after all that has been said, the inquiry would be useless. If the soul be an *Entelechy*, as Aristotle asserted; if it be, as Plato said, that which displays itself in three energies—the rational, the irascible, and the appetitive; if, with some modern philosophers, we regard it as “that inferior part of our intellectual nature, which shows itself in the phenomena of dreaming, and which is connected with the state of the brain;” if, as Aristotle in another place defines it, it be “that by which we live, feel, or perceive, move, and understand;” if it be the ego or the sum of its faculties; if its essence reside in thought, in sensation, or in will; if it be, as Reid defined it, “the principle of thought;” if it be “a self-moving force” or “incorporate spirit;” if it be, in short, anything which you like to call it, who will assert, or rather who will prove, that animals have no soul? It is no part of my task here to inquire what the soul is, and I have merely taken the readiest definitions that came to hand*: but does any one of these definitions, or all of them put together, furnish a *proved and specific characteristic* of the genus Man? Did not the feeling that such is *not* the case lead to the automatic theory of Descartes, Polignac, and Priestley on the one hand, and, on the other hand, to the beliefs of Father Bongéant and French, that they were acted on by spirits, and of Newton and Hancock, that their actions are directly due to the agency of the Creator?

14. Finally, then, is *immortality* the distinguishing point? Here, again, who shall venture to say? If no one but a rash man would venture to assert that *any* animals *are* immortal, would any one be less rash who should take upon himself to declare positively that *no* animals *can* be? Certain it is, that the moral and physical analogies led Bishop Butler to regard a future life for animals as resulting from some of the same general arguments as those which have weight in establishing the immortality† of man. The great bishop deprecates all difficulties on the score of the manner in which animals are to be hereafter dealt with, as wholly founded in our ignorance; neverthe-

* See Fleming, *Vocab. of Philos.*, s. v., and p. 263.

† It is, however, observable that in the Bible, *ψυχή* is used for animal life, and *πνεῦμα*, for the life of men. For the well known passage of Butler, see *Analogy*, ch. i: “But it is said that these observations are equally applicable to brutes,” etc.

less I cannot refrain from here quoting a powerful passage from Mr. Ruskin to show what moral reason we have for not denying that brutes also may be destined for a future existence. The doctrine of immortality is deeply mingled with that of future retribution; and Mr. Ruskin asks, "Can any man entirely account for all that happens to a cab-horse? Has he ever looked fairly at the fate of one of these beasts as it is dying? measured the work it has done, and the reward it has got? put his hand upon the bloody wounds through which its bones are piercing, and so looked up to heaven with an entire understanding of heaven's ways about the horse? Yet the horse is a fact—no dream—no revelation among the myrtle trees by night; and the dust it lies upon, and the dogs that eat it, are facts; and yonder happy person, whose the horse was till its knees were broken over the hurdles, who had an immortal soul to begin with, and peace and wealth to help forward his immortality, . . . this happy person shall have no stripes—shall have only the horse's fate of annihilation; or if other things are indeed reserved for him, heaven's kindness or omnipotence is to be doubted therefore."

To those who think over this passage, it will not appear irrelevant in the present discussion, and it may perhaps show the possibility of a doubt whether the destinies even of the future be reserved for man alone. Even Leibnitz, regarding individual permanence as no exclusive privilege of man, extended it to animals also, attributing "indefectibility" to them, while he reserved the word immortality to paint the higher possibilities of man.

That man is almost immeasurably removed from animals in the degree of development which their several faculties have attained, has never been disputed. But "no difference in degree can constitute a difference in kind;" and if it be asked "What is the generic point of distinction between men and animals?" the answer must still be, *Natura non agit saltatim*; there is no such point of distinction; man does not form an order apart from the rest of the animal world; he is linked to that world by humiliating, but indissoluble ties of resemblance and connection; and even the matter which constitutes both *his* body and that of animals is but the same as that which goes to the composition of the inorganic world.

PHILALETHES.

ON THE PHENOMENA OF HYBRIDITY.*

IF we can suppose an observer so favourably placed as to be capable of taking in all animated nature at a glance, and to be at one and the same time equipped with all our present stock of scientific knowledge, without being embarrassed with any natural or acquired prejudices, let us endeavour to imagine what would be the sequence of his ideas, and his conclusions on the phenomena of the production of offspring by generation. On considering in what form and under what conditions animal life may be said to commence, he would be aware that all animated beings spring from the union of two cells in a proper receptacle, which is for the most part a womb. "Whatever be the difference," says Agassiz, "in the outward appearance or the habits of animals, one thing is common to them all without exception: at some period of their lives they produce eggs, which, being fertilised, give rise to beings of the same kind as the parent! The true egg, or, as it is called, the ovarian egg, with which the life of every kind of living beings may begin, is a minute sphere, uniform in appearance throughout the animal kingdom." This ovarian egg, lying thus in the womb of every female of every kind of living being, is fertilised by the introduction and contact of an equally microscopic body, which proceeds from a male, and is equally similar in all males,† so far as our present microscopes can discover.‡ The conjunction, therefore, of a sperm-cell with a germ-cell in a fitting receptacle, would appear to our observer the only necessary for causing an evolution of life. Nor is it possible at present to say that such a conclusion would be wrong. Indeed, the well-known instance of the fœtus developed in a boy's body, and preserved in the Hunterian Museum, is sufficient to show that even the usual receptacle of the microscopic cells, if they can be brought together, may be dispensed with, so far as an actual commencement of life is concerned. Our observer, being of course

* On the Phenomena of Hybridity in the Genus Homo, by Dr. Paul Broca. Translated and edited by C. Carter Blake, F.G.S., F.A.S.L. Longmans: 1864.

† This has nowhere been better treated of than in that admirable book *The Elements of Social Science*, fifth edition, E. Truelove, 240, Strand. "There is no distinguishable difference between the germ of the humblest plant and of man." (P. 69.)

‡ Some say positively there is no difference. Thus J. W. Draper, *Hist. of the Intellectual Development of Europe*, London, 1864, vol. i, p. 226. "From a single cell, scarcely more than a step above the inorganic state, not differing, as we may infer both from the appearance it offers, and the forms through which it runs in the earlier stages of life, from the cell out of which any other animal or plant, even the humblest, is derived."

above all the aversions and prejudices of species, would be entitled to suppose that there was no obstacle to the constant formation of every kind of creature, and that individuals of different sexes might produce beings indefinitely varied, and partaking of the attributes of their common, though widely different parents. But he would soon become aware that there were physical and mechanical difficulties, which would prevent, at all events, every kind of otherwise possible combination. Having allowed for this, and for the improbability that animals living on the land and those native to the water, would produce a progeny necessarily capable of living in the one which the mother inhabited, for it might have too many of the organs of its father to do so, our observer might still expect to find animated nature infinitely more varied than we see it to be. Nor, were the bodies of female animals diaphanous to such an eye, is it so clear that he would be entirely disappointed. When we speak of the sterility of certain unions, we mean that they have produced no being who has sustained an existence exterior to the womb; but it by no means follows that they have produced no life at all. And when we consider that the sperm- and germ-cells which are hereafter to produce a human being, cannot be distinguished in any way from those which are to produce an elephant or a mouse, we are not in a position to assert that, could the cells of an elephant and a man, or a man and a mouse, be brought together in a proper *nidus*, they would be incapable of producing any living being, however short-lived, whatever: *a priori*, then, our observer would be justified in supposing that any germ-cell could be fecundated by any sperm-cell; nor could we disprove it. Some considerations, however, such as the relative size of the probable fœtus to the female parent, and the variance of the periods of gestation, might be sufficient to balance the probabilities deduced from the uniformities of the ovarian egg, as to the emancipation of products from the womb in such a condition as to be capable of exterior and independent life. But, having been prepared by these reflections to find some practical restriction on the production of beings from animals of different appearance, our observer would, I think, be justified in coming to the conclusion that, inasmuch as there is no perceptible difference between the germ- and sperm-cells and the ovarian eggs of any kind of animated beings, where there exists no physical or mechanical difficulty to prevent their junction in a womb, and where the periods of gestation which the authors of one pair of cells have each gone through are not widely different, and where the size of either parent is neither too great nor too small to present a probability of the offspring destroying its mother too soon by a too large development, or being stifled itself from want of being

sufficiently large, there we may expect that the union of any sperm-with any germ-cell would naturally be productive.

Dismissing our imaginary observer, and coming down to our own limited intellects, I think I have succeeded in showing that, *a priori*, from the laws of embryology, we ought not to deny the possibility, or even the probability, of productive unions between animals not greatly different in size and in their periods of gestation. The usual mode of arguing has, however, been the reverse; that is to say, it is asserted that no one has a right to believe in the possibility of the production of any kind, which we cannot point to as already existing. This argument was sufficiently powerful before it was suspected that the earth had been the home of beings totally different from those who inhabit it now, and whilst the facts relating to the ovarian egg were equally unsuspected. To our mind, in the presence of both these series of facts, the argument from non-existence loses all its force. But it will be said, if such unions as you hint at would be productive, how is it there is no example of them? An explanation of this may fairly be asked; but, even if no satisfactory one could be given, it would be clearly unphilosophical to say that, because there is a repugnance on the part of different creatures to effect what we call unnatural unions, therefore such unions, if effected, would be necessarily unproductive. Thus, when it is said that Divine Providence has rendered such unions unproductive for the purpose of preserving what is called order in creation, it would be equally fair to say that order is preserved, not by causing such unions to be unproductive, contrary to what we might expect from our knowledge of embryology, but by the fact that the disgust for such unions renders them so few, that their products, if they ever exist, stand no chance in the struggle of life with the opponents they have to contend with on either side of their ancestry.

Whilst, however, we assert that, so far as we know, such unions must be as productive as any others, we cannot avoid considering the question how it is so few instances in the affirmative are to be found. And when we come to consider the case of beings so nearly allied to each other, at all events, as are the different groups, races, or species of man, differing scarcely at all in size and in the period of gestation, from what has been said, it is clearly our opinion that those are in the right who affirm that, until the contrary is distinctly proved, we ought to assert, on philosophical grounds, that all men are what M. Broca would call *eugenic*. "Still," to quote his words, "there must have been a certain number of fundamental facts, which led even monogenists to deny the viability of *all* crossed races. They must have sought in vain among the nations of the earth for a race mani-

festly hybrid, with well-defined characters, intermediate between two known races, perpetuating itself without the concurrence of the parent races."

Whether such a race cannot be found, we shall see by and by; but at present we shall content ourselves with saying that the burthen of proof lies on the opposite side. The production of such a race would clearly not satisfy M. Pouchet. "The universality of reproduction between all races of men has been quickly admitted. Have all combinations possible been observed, the union, for example, of the Esquimaux and the Negro, the American and the Australian, the Tartar and the Bushman?"*

It is strange reasoning to say that, because large geographical spaces and differences of climate have prevented the union of certain closely allied beings, therefore we have no right, knowing what we do of the absolute identity of these beings in their earliest phase of life, to assume that they would be prolific, until almost impossible experiments have actually been made.

Dr. Prichard, starting from very different premises with our own, brought forward three examples of the fusion of very different kinds of men. These M. Broca has well shown to be unsound, and goes on:

"The three examples adduced by Prichard having thus proved without any absolute value, a diametrically opposite doctrine has been advanced. It has been said that, since this author was obliged to go so far for such indifferent examples, it amounts to a proof that he could not find any others, and the conclusion was arrived at that a mixed race neither has, nor could have, a permanent existence. These persons," he goes on to say, "have reasoned like the monogenists, who, knowing from experience that *certain* human races may become mixed without limitation, have affirmed that *all* the races, without exception, are in a similar condition."

Whatever be the grounds on which the monogenists may go, the reasons why we ourselves should expect *a priori* the indefinite prolificacy of all human beings, are clearly very different; and until the powers of the microscope have been so much enlarged, as to be able to show us the differentiation of the sperm and germ cells, and the ovarian egg of different animals, or kinds of men, to be such that the union of some cannot be expected to produce a being capable of life, exterior to the womb, and thoroughly independent, and with all the conditions of vitality, we shall be of opinion that nothing but an immense array of facts upon any single example, all bearing the other way, ought to induce such an opinion as the non-prolificacy of any human groups with each other.

* De la Pluralité des Races Humaines, Paris, 1858, p. 134.

Meanwhile, how does M. Broca put the question? "Facts must answer the question. Some are in favour of the monogenists, others support the opinion of their adversaries; from which we shall be enabled to infer, that in the *genus homo*, as in other genera of the mammalia, there are different degrees of homœogenesis, according to the races or species; that the cross-breeds of certain races are perfectly eugenesic; that others occupy a less elevated position in the series of hybridity; and finally, that there are human races, the homœogenesis of which is still so obscure, that the results even of the first intermixture are doubtful.

"To demonstrate that eugenesic hybridity really exists, one instance is sufficient, provided it be conclusive; and to find this example, we need not travel beyond our country. The population of France, as we have amply established elsewhere, is descended from several very distinct races, and presents everywhere the character of mixed races. The pure representatives of the primitive races form a very small minority; nevertheless, this hybrid nation, so far from decaying, in accordance with the theory of M. Gobineau—far from presenting a decreasing fecundity, according to some other authors, grows every day in intelligence, prosperity, and numbers."

So far, then, the facts agree with what we might have expected. But M. Broca goes on to say, that it is a great error to consider all intermixtures of men as eugenesic. And it will be seen that in his remarks upon this point, lies the great interest of the little volume before us.

The first instance considered is that of the union of the Negro and the white in America: and it is at once admitted that such unions are at least *paragenesic*; that is to say, that the mongrels of the first generation have a partial fecundity, but tend to necessary extinction, unless they are recruited by one of the parent stocks; in which case, they may breed indefinitely. The experience absolutely necessary to determine this question can, however, never be obtained. "It is absolutely unknown what is the relative proportion of Mulattoes of the first degree who intermarry between themselves, and such who intermix with other mestizos, or with individuals of a pure race; nor can we know what, in a given population, should be the normal proportion of these Mulattoes if they were perfectly prolific *between themselves*." The case of the mixtures between the Negro and the Caucasian would, under any evidence, be unsatisfactory, because neither race is on its native soil. The European would, in the opinion of many, be incapable of propagating his unmixed race in the West Indies, and the most southerly parts of the United States. Indeed, there are those who go so far as to say, that the European would in a

few generations be extinct altogether in America, if it were not for the constant introduction of fresh blood from the motherland. And these are the very same persons who deny the prolificacy of the Mulatto. It has also been stated, that the same tendency towards extinction is visible in the pure Negro; certainly north of a certain degree of latitude,* but also throughout the West Indies.† Now, if this is the case, it is most likely that the want of power of perfect acclimation, which appears in both races, would be intensified in their offspring; and also that such tendency would be somewhat counteracted if such offspring was crossed again by one of the original stocks, who in many cases would spring from ancestors more recently imported from the native country.

If, for instance, the observations of M. Broca on the mixed populations of France had been made, not in France, the climate of which is favourable to the original stocks, but in some climate, such as that of Algeria, which is the contrary, he would not have come so easily to the conclusion that they are thoroughly eugenic. We must not, therefore, assert that races brought together in a country foreign to both, are deficient in the power of breeding between each other; but are equally justified in supposing that the paucity in the number of cross-breeds may arise from the non-viability of the individuals caused by the nature of the climate, and that extinction, or a visible tendency to it, is brought about, not by any want of prolificacy, but by the premature death of individuals before they become thoroughly acclimatised.

This, indeed, is partly admitted by M. Broca in a note,‡ where, speaking of Batavia, he says: "It seems thus that the influence of climate produces some modification in the generative powers of Europeans, rendering them less apt to procreate males *even with the women of their own race*. This modification may be transmitted to their descendants by intermixtures."

A disparity in the number of males would produce effects which there has been no attempt yet made to calculate.

So, also, of the Lipplappen, or Mulattos of Java, we find that the

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|---|---|----|-------------|
| * In Louisiana the number of idiots among the Negroes is as | 1 | to | 4,310 |
| In South Carolina | - | - | - 1 " 2,477 |
| In Virginia | - | - | - 1 " 1,299 |
| In Massachusetts | - | - | - 1 " 43 |
| In Maine | - | - | - 1 " 14 |

† By the excess of deaths over births, the Negro population in the whole of the English Antilles undergoes every year a diminution of 4 in 1000: in one of these islands (Tobago) the annual diminution attains the enormous number of 16 to 1000; and Col. Tulloch says, "Before a century the Negro race will be nearly extinct in the English colonies of the West Indies." (Boudin, tom. i, intr., p. xl.)

‡ P. 40.

Dutch do not perpetuate their race at Batavia; and "thus it is not demonstrated that the sterility of the Lipplappen is the result of their hybridity." "But," says M. Broca, "if the defective fecundity of the Lipplappen of Java is due to the deleterious influence of climate, it is very difficult to attribute the great prolificness of the Malay-Chinese to the benignity of the same climate." We see no difficulty in this at all. The climate which is deleterious to the European may not be so to the Chinese. As the latter do not bring their own women with them, we cannot tell, by direct evidence, that they would be as prolific as at home, contrary to what we have just seen to be the case with the Dutch. But so far as the facts can be a guide, it is fairer to say that the prolificacy of the Malay-Chinese rather shows the climate to be not unhealthy for the latter, than that the comparative paucity of Chinese is the reason why their Mulattoes thrive in some of the islands of the Indian Archipelago. And "the more eastern islands, where the Malay-Chinese do not thrive, *are more unhealthy than Java.*" This, again, is in favour of the theory, that climatic influences are more at the bottom of a seeming want of prolificacy, than any immediate cause affecting generation itself.

The opinion of Dr. Bowring with respect to the hybrids of Malasia seems quite opposed to that of M. Broca. "A middle race," says he, "such as China contributes in the shape of emigrating millions, is wonderfully advancing the work of civilisation. The mestizo descendants of Chinese fathers and Indian mothers form incomparably the most promising portion of the Philippine population.* . . . The mestizos, or mixed races, form a numerous and influential portion of the Filipinos. The highest society is seldom without a large proportion of mestiza ladies, children of Spanish fathers and native mothers. The great majority of the merchants and landed proprietors belong to this class, and most of the subordinate offices of government are filled by them. There are very many descendants of Chinese by native women; but the paternal type seems so to absorb the maternal, that the children for whole generations bear the strongly marked character which distinguishes the genuine native of the Flowery Land, even through a succession of Indian mothers. De Mas speaks in the highest terms of the mestizos of Chinese or Mongolian descent. . . . There can be no doubt that the predominance of the characteristics of the father over those of the mother has improved, through successive generations, the general character of the race of mestizo-Chinese. The children of a Spanish mestizo, by a Chinese mestiza, are called *Torna atras—Going back*; those of a Chinese mestizo by an Indian woman are considered as Chinese, and

* Bowring (Sir J.), "A Visit to the Philippine Islands," p. 109. London, 1839.

not Indian half-castes. The mingling of Chinese blood is observable in all the town populations."*

The two most disparate branches of the human family are pronounced by M. Broca to be the Anglo-Saxons and the Andamanes generally; under which name are understood to be comprised the Australians, Tasmanians, and all the blacks with woolly hair of Melanesia and Malasia. And he states that, according to the accounts of most authors, the Mulattoes of Australian and English are exceedingly rare; so much so, that their very existence has been denied. Hence one of his results is formulated as follows: "8. That the lowest degree of human hybridity, in which the homœogenesis is so feeble as to render the fecundity of the first crossing uncertain, is exhibited in the most disparate crossings between one of the most elevated and the two lowest races of humanity."

The evidence brought forward to support this conclusion occupies about fifteen pages, or nearly one quarter of M. Broca's book. We may therefore assume that, even in his own opinion, this point is of great importance for him to prove. If his authorities are at fault, or subsequent investigations produce different results, it would seem difficult to attach much importance to the remaining portions of his argument, except so far as the proofs go which he has collected of the instances in which different races are undoubtedly eugenic.

The authorities themselves are at once purely negative; and as the information of travellers must have been derived from the colonists of Australia and Tasmania, they are entirely dependent upon the feelings and prejudices of those colonists. To Englishmen, who were accustomed not many years ago to shoot down the "blacks" as if they were animals, any inquiries respecting their children would seem very superfluous. And the easiest way of warding off any unpleasant investigations as to what became of the half-breeds, would be to assert that such never came to anything. This element in the value of the information adduced by M. Broca does not seem to be taken into account by him. It may, however, be said that a very different tone now prevails in dealing with these aborigines; and consequently, that if any such Mulattoes are born, we ought to hear something of them. But in his *Treatise on the Races of Man*, published in 1859, M. Omalius d'Halloy still finds himself enabled to say: "It is remarkable that, though a considerable number of Europeans now inhabit the same country as the Andamanes, *no mention is made of the existence of hybrids resulting from their union.*" This might seem conclusive. But singularly enough, almost at the very moment that the volume of M. Broca was being given to the English public,

* *Ib.*, p. 113, et seq.

in a debate of the Anthropological Society of Paris, an exactly opposite assertion has been made with every appearance of being well-founded. "Finally, M. Dally brings forward, always without proofs, *the almost perfect infecundity* of the Anglo-Saxon with the Australian and Tasmanian female; and that proposition is asserted in 1863, just when the Australian newspapers are taking notice of entire populations of these half-breeds in the islands of Bass's Straits; half-breeds whom these newspapers praise most highly from the triple point of a physical, moral, and intellectual view."*

Here issue is fairly joined on this interesting question; and we cannot suppose that there will be much difficulty in ascertaining on which side the truth lies. Should the assertion of M. Boudin be correct, the views of M. Broca must necessarily be very much modified.

Meanwhile, it is very remarkable that he should make no mention at all of the well-known case of the Pitcairn islanders. A more authentic instance of a cross-breed between Englishmen and Polynesians, and their descendants, can never occur; and we will conclude our remarks on M. Broca, by extracting the latest account of them from the *Cruise of the Fawn*, leaving our readers to draw their own conclusions.

"Nine Englishmen, six Otaheite men, and twelve Otaheite women, arrived at the little island of Pitcairn shortly after the mutiny of the *Bounty* in 1790. All the men, except two Englishmen, had destroyed each other by 1799; and in that year one of the remaining Englishmen died also.

"The mixed progeny of Englishmen and Otaheitans had increased, in 1831, to eighty-five, and they had some difficulty in finding means of subsistence on the island. They were, therefore, all removed at their own request to Tahiti. But after a residence there of nine months, being disgusted with the levity and low morality of their Tahitian friends and relatives, and having lost twelve of their number by fever, they returned to Pitcairn.

"Their numbers began again to increase so fast, that in 1855 they petitioned the British government to grant them Norfolk Island for their own; and in 1856 they were removed thither.

"Two families have already returned, consisting chiefly of young girls. One of the matrons told me her husband had promised that four or five of his boys should go down by-and-bye to marry their cousins, *for all are more or less nearly related*. Uncles and aunts are seen carried about in the arms of their nephews and nieces, and it will be a difficult matter, by-and-bye, for the genealogist of Norfolk Island to make out a correct family tree. The women, it seems, have numerous families, and the number of marriageable females considerably exceeds that of the young men; so there are now somewhere

* Bulletins de la Soc. d'Anthrop. de Paris, tom. iv, p. 681.

about twenty doomed to celibacy, for no one is allowed to land upon the island without the approbation of the acting magistrate, and the consent of the governor.

"They have inherited a love of dancing from their Otaheitan mothers."^{*}

THOUGHTS AND FACTS CONTRIBUTING TO THE HISTORY OF MAN.

I. UNITY in Nature, and Uniformity in its Modes of Development.

II. Analogy in the Progressive Development of Man and Nature.

III. Analogy in the Progressive Development of the Individual Man and Nations.

IV. The Order of Nature is Progressive Development through Successive Stages.

V. The Stages of Development in Man and Nature are Rise, Progress, Maturity, Decline, and Decay.

VI. Adaptation in Nature of Everything to its Position in the World.

In the universe, from the larva of the butterfly, through man, to the entire system of the universe, all is progress through successive stages of development.

Progress through successive stages of development is the order (*κοσμος*) through which all things must of necessity move.

The progress which I would speak of here, is not progress as usually understood, progress in a straight line, it is progress in a circle; starting from a point, it comes back to the same point again.

In every species of development there is a culminating period, when every development reaches its highest point of perfection and fulness, which is manifested at the period of its existence by the beauty and perfection which the development attains to at that period.

It is the inevitable law of all developments, the tendency of all things after having reached maturity, to decline and to decay. Man and nations, art and nature, are equally subject to this law.

There is an expression used by a Greek philosopher, *κυκλος αναγκης*. It is a law of necessity that all things move in a circle. It is the law of development that all things have a rise, progress, maturity, decline, and decay; all things moving through their cycle of progressive development. The different geological ages are but cycles of development; the various extinct fossil animals are evidences of beings run-

* Hood's "Cruise of H.M.S. Fawn in 1862." London, 1863.

ning through their cycles of development, and ultimately dying out. Man himself has his cycle of development. The seasons undergo their changes in cycles. The earth and planets move in circles; the eclipses of the moon recur in a periodical cycle. By the precession of the equinoxes, the whole of the equator moves round that of the ecliptic, employing a period or cycle of no less than 25,868 years. According to Sir William Herschel, the sun itself, with the whole solar system, is performing a cycle, moving through space at the rate of 150 millions of miles a year.

The history of nations and peoples is but a history of developments, each people having its cycle of development.

As the laws which govern the planets in their course are modified by disturbing forces, so the laws of development are modified by climate, species, race, position in the world.

There is a distinct and separate development for man considered as the individual man, for man in the aggregate as a people, for man considered as the human race. The development of the individual man rarely ever exceeds the limits of one hundred years; of man as a people, seldom exceeds one thousand. To the development of the human race we can affix no period of limitation; but, considering that the world is now almost entirely discovered and peopled, and that there is no spot on the earth where there is any likelihood of another people arising and developing itself into a great nation, we may say that the development of the human race has reached its culminating point, and is now on the wane.

The great scheme of nature is a system of gradation and subordination one to another. From the trilobite, which is the earliest form of life, to man, all is gradation from a lower to a higher and more perfect form of organisation.

In the laws of development there are no sudden leaps, each stage must form a stepping-stone to the next stage. In the development of the laws of nature and science, each truth is the result of a former truth; each fact is a stepping-stone to the solution of another fact; each thought is the germ of another thought. There is a sequence in all things; one thing grows out of or is evolved from another.

As it gives us a high idea of the skill and ingenuity of a watchmaker when he makes a watch which will go on for years without there being any further need of having recourse to his skill and interference, so it ought to give us a lofty conception of a Deity, who has created a world whose system can proceed onwards by the government and development of *his* laws alone. And as it would prove want of skill and ingenuity in a watchmaker, who should make a watch which would frequently require his aid, so a constant interposition of

the Deity in the affairs of the world would be presuming a want of skill and carelessness in the development of those laws which the Divine lawgiver has imposed on the universe.

Development of Mind. The progress of the development of the human mind in different ages, climates, and circumstances, is uniform, acting upon the same principle and to the same end.

Assuming that principle which is the essence of induction, the conviction of the universal and permanent uniformity of nature, it follows as a necessary consequence that the actions of man in the aggregate, and the development of the phenomena of the human mind, must share the same laws of order, uniformity, and continuity, which belong to all parts of the material world.

As it is the nature of the human mind to be always uniform in its operations, always consistent in its results, it follows that, when employed upon the same subjects, its results and conclusions are the same. As the Bishop of Natal beautifully expresses it, "The mind of man, in all ages and in all countries, musing on the origin of all things, has been led by a Divine instinct to the same grand conclusions."

Human nature is one and the same everywhere; the same wants beget the same invention and use of the same necessities to supply those wants; the same ideas arise within the mind of man, suggested by the same objects.

As in early childhood our natural instincts are more manifest, so in the earlier periods of human civilisation man's natural instincts are more fully developed.

There is an instinct peculiar to the common nature of man, by which man and nations, at each stage of their development, work out independently certain ideas and suggestions peculiar to those stages of development.

Man may undergo change of place, climate, and appearance; still the same development of mind takes place, subject to the laws that have operated through all ages.

Comte points out three distinct stages of human development—the theological, the metaphysical, the positive. These coincide with the stages of the development of mind in the individual man. In childhood all phenomena are explained by authority, or referred to powers which it cannot comprehend. Youth begins to think for itself, and is led to discuss metaphysical entities. Manhood is obliged to acknowledge that all phenomena are subject to law.

The suggestive principle is awakened by necessity in the mind of man, according as his wants and habits require. •

This suggestive principle, which is peculiar to our common nature,

leads man to invent objects to supply his daily wants and requirements; other objects and forms being suggested as his necessities increase and are more widely extended. Does man want to tear up the soil to prepare it for the reception of grain, he invents the plough. Does he want to cut down timber, or does he require the use of some sharp instrument, the hardness of flint and of metal, and their capability to receive a fine edge, lead him to use those materials for that purpose, and suggests the form of a chisel, a hatchet, or a knife.* Is he at war with his enemies, with the same materials he forms an arrow, and, to inflict greater injury on his enemy, the shape of a barbed arrow is suggested to him. The softness of clay, and the hardness it acquires when baked in the sun, suggests the idea of making cups, vases, and other utensils of that material, and leads him to invent the potter's wheel. His taste unfolding and the suggestive principle developing itself more and more, he shapes other forms, and acquires a taste for ornamentation to be applied to these utensils. In the early periods everything suggested was of the simplest form. In the early modes of sepulture the simplest forms were adopted, and were such as would be naturally suggested. The tumulus, which was one of the simplest forms, was adopted in several parts of the world. The cromlech, which is also another simple form, is found all over the world, and is not a characteristic form adopted by any separate people, or indicative of any particular race. The pyramid, too, is a form of sepulture found in countries the most widely apart—in Egypt, in Central America, and in Japan.

Words and phrases expressive of similar ideas and usages are found in the early development of languages and peoples, which have their source in the nature of the human mind and of our sensations; for the development of the human mind is evolved under much the same relations in regard to external nature. Similar objects make similar impressions on the mind, which is one and the same everywhere. Darkness suggests the idea of death to the refined Greek, as well as to the barbarous American.

When the human mind reaches a certain period of development, certain ideas and facts, results of that stage of development, are necessarily evolved. We have an instance in the discovery of Neptune. The progress of astronomy had reached that stage when the discovery of Neptune as a part of the system of the universe could not but be evolved. Adams and Leverrier, working independently, were led to its discovery. In the progress of science, we also find Newton and Leibnitz developing further previously known scientific facts; discovering the doctrine of fluxions at nearly the same period. Many

* Man, as Franklin defines him, is a tool-making animal.

ideas and facts in metaphysics and science have been anticipated by the Hindoos and Egyptians. This was the result of the earlier development of these nations, they being many centuries in advance of European civilisation.

The various myths, legends, fables, and other products of the human mind in different countries, seemingly identical, prove that the spontaneous tendencies of human thought and imagination are similar in all countries. They are the phenomena of the human mind, developing themselves in accordance with laws peculiar to the human mind in its different stages of development. Among the mythological tales of Polynesia we find a great similarity to the fairy legends of Connaught.

Nothing can afford a stronger evidence of the uniformity of the operations of instinct and of the suggestive principle in the mind of man, than the striking resemblance of the worked flints to each other in almost every country where they have been found; they present identical forms, obviously the result of identical intention.

The various kinds of almost identical ornamentation found in widely apart nations without intercommunication, afford a remarkable evidence of independent evolution of the human mind, and self-development among nations. The simplest form of ornamentation, the zig-zag, is found wide spread among all nations. It is as naturally suggested to the savage in carving his club, as to the Greek artist in painting his vases, when the artistic instinct is awakened and developed in man. As Humboldt remarks, nations of very different descent, when in a similar uncivilised state, having the same disposition to simplify and generalise outlines, and being impelled by inherent mental disposition to form rhythmical repetitions and series, may be led to produce similar signs and symbols. The cross, another form of ornamentation, is found in endless varieties in the most widely apart countries. It is also a form naturally suggested to man at any period of his development, for it is merely the intersection of two lines. In the paintings on Egyptian tombs, crosses, with other fancy devices, may be seen figured on the robes of the Rot-n-n and the Rebo, a people dwelling in the vicinity of Mesopotamia, showing, as Sir Gardner Wilkinson remarks, that this very simple device was already in use as early as the fifteenth century before the Christian era. Crosses in endless varieties are found on the Greek vases. Crosses, with other patterns, are figured on the tombs in Phrygia. The cross is also a distinctive sign in several Mexican hieroglyphs. It forms the central ornament of a tablet at the back of an altar at Palenque. Specimens of Peruvian pottery have also been discovered with a row of well-defined Maltese crosses. The fret is almost uni-

versal; it is found in China, in Greece, in Mexico, Central America, and Peru. The wave scroll and the so-called Vitruvian scroll are found figured on Peruvian pottery.

Man being a creature of instincts, which are a part of his nature in every clime, and are universal, the same superstitious customs, which are the offspring of these instincts, will crop out in different countries. The belief in ghosts and the evil eye is universal. The same customs to avert the terrors of ghosts and of the evil eye are had recourse to in countries the most unconnected. The missionaries Huc and Gabet were astonished to find an extraordinary resemblance between Popery and Buddhism. In this there was nothing extraordinary, as the features of idol worship are the same in all countries. A coincidence of errors is the natural result of the unenlightened stage of man's development, and is as natural as to find similar imperfections, which "flesh is heir to", crop out in man, in nations, however widely apart.

The human mind is continually repeating itself. We find a family likeness in all the mental manifestations of the human family. The same physiological phenomena appear generation after generation, century after century. All prophecies, oracles, witchcrafts, miracle-mongers, table-turnings, spirit rappings, are but manifestations of the same human mind in an abnormal or diseased physical condition, these phenomena recurring at certain stages of man's development.

Development of Species and Race. Unity in typical structure and in one common nature, intellectual and physical, each species according to its distinct grade of development, is the connecting link between the diverse species of men.

Unity in typical structure and physical development is not enough to constitute an unity, or to establish an identity of species. A dog and a man have many things in common with regard to their typical structure. They have eyes, nose, mouth, ears, legs. A dog has reasoning powers, imagination; it shows the same passions with man; it exhibits anger, jealousy, love, generosity, fidelity, is taught by experience; yet no one will say that a dog and a man are of the same species.

The different expressions, unity of species, and oneness of the human species, seem to suggest different meanings. The unity of species would seem to imply that the entire human race was descended from one common stock; the oneness of the human species, that each species has many characteristics in common with the other species, and that they share the common instincts peculiar to the human race, and are endowed with a common typical structure, but still that each species has a separate and independent origin adapted to its position in the world, as in the lower animal creation several species share many instincts and distinct attributes in common, but still they are

distinct and separate species, fitted and adapted to their position in the world. The expressions, however, are used indiscriminately.

Unity in the intellectual and social development in man is the connecting link between the diverse races of men.

In accordance with the great scheme of nature, which is a system of gradation, there must be a gradation of the races of mankind. In corroboration of which we quote the following: "The leading characters of the various races of mankind are simply the representatives of particular stages in the development of the highest Caucasian type. The Negro exhibits permanently the imperfect brow, projecting lower jaw, and slender bent limbs of a Caucasian child some considerable time before the period of its birth. The aboriginal American represents the same child nearer birth. The Mongolian, the same child newly born." Therefore, if each race is a representative of a lower or higher stage of development, it follows as a necessary consequence that there must be a gradation of races from a lower to a higher race.

The relative position of each species of the human family must depend on its degree of development. Each species is the representative of a stage of development forming a grade in the ascending scale. According to Humboldt, the inhabitants of New Holland and Van Diemen's Land appear to stand in the lowest grade of civilisation. Professor Owen considers the Andaman Islanders to be in the lowest grade.

The degree of development any people can attain to depends on the species they belong to. The Malay, the Mongolian, the Negro, can reach a certain stage of development alone, and no further. As proofs of the development of peoples being arrested at a certain stage, we may quote the following. The Sandwich Islanders make progress in the early part of their education, and are so far apt and quick as children of civilised Europeans, but at this point they stop, and seem incapable of acquiring the higher branches of knowledge. Negro children also exhibit the same incapability of progress beyond a certain stage.

The great difference between man and man is in the greater or less perfection of his organisation. As there are grades of relative perfection, from the Negro to the Caucasian, so there are grades of perfection in the individuals of any separate nation or town, each differing according to the greater or less refinement of organisation.

From the uniformity in the law of adaptation of everything in nature to its position in the world, it is evident that the Caucasian and the Negro must have a different origin and be separate races. For the Negro is by his physical constitution adapted to a warm climate, the Caucasian to a mild climate.

Is there anything unreasonable in supposing that the same God who created endless varieties of species in the lower animal creation, and assigned them a region of the earth adapted to their physical constitution, from the infinitesimal infusoria to the gigantic elephant, could have also created separate and distinct species of men, fitted by their physical constitution to their position in the world?

Capability of improvement and power to attain to the highest and most perfect stage of development are the distinctive characteristics of the Caucasian race alone. Bunsen gives the following formula as a basis for some striking results respecting the universal history of mankind: "The nations who speak the languages reducible to a common centre in High Asia, are the *only* tribes who hitherto have taken a place in the history of the world."

When St. Paul announced to the assembled Athenians that "all nations are of one blood", it must be remembered that this was proclaimed to the Caucasian race alone, and was meant to the Caucasian race alone as the only race then known. The Mongolian, the Malay, the American, were then unknown. The Negro was totally ignored.

Race may be considered as a separate line of growth or development of one species, as the Saxon or Celtic races are distinct lines of growth of the Caucasian. In the opinion of Müller, "race" is derived, not from "radix", as was hitherto supposed, but from the old high German "reiza", line, lineage.

It has been said by Waitz (p. 265) that we see one and the same people proceed from barbarism to civilisation, and again relapse from its high state, and its capacities decline; but the cranial shape remains the same. This is the consequence of the law of development; in spite of cranial shape, peoples must have their rise, progress, maturity and decline; the law of development must be fulfilled. The Greek cranial shape still remains, but the Greek people have run through their cycle of development. It is the same with the individual man; however great may be his intellect, and however perfect the form of his head, the law of development must be fulfilled—he must pass through the stages of rise, maturity, and decline.

Man in his earliest stage of development was equally naked, both as to body and mind. Like other animals, without experience of the past, without knowledge of the future, he wandered through wilds and forests, guided and governed purely by the affections of his nature. In the words of Horace, quoted by Sir Charles Lyell, "men in this stage were a dumb and filthy herd; they fought for acorns and lurking places with their nails and fists, then with clubs, and at last with arms, which, taught by experience, they had forged. Man on emerging from this primitive barbarous stage became a nomadic hunter and

fisher, unacquainted with every art but the imperfect one of fabricating in a rude manner his arms and some household utensils, and of constructing and digging for himself an habitation, dependent on chance and the seasons for the means of satisfying his wants. In this stage the progress of man must have been extremely slow, as we still see evidences of it among the American Indians. As man advances, becoming conscious of the sustenance afforded by the animals he has tamed, and which he has learned to preserve and multiply, he becomes a shepherd, but to a certain extent continues a nomad, wandering with his flocks wherever pasture or security invites. In the further progress of his development, when no longer content with the fruit and plants which chance throws in his way, he learns to form a stock of them, to collect them around him, to sow, to plant them, to favour their reproduction by the labour of culture, he becomes stationary, and devotes himself to agriculture. The succeeding stage of his development is when, having acquired property in flocks, and in land which he has cleared and cultivated, and being anxious to secure quiet possession of what he had gained by his labour, conventions, tacit or expressed, were introduced into society, and became the rule of the actions of individuals, the measure of their claims, and the law of their reciprocal relations. Men experiencing the benefits derived from these, law and government were gradually evolved and developed. Law and government once established, the progress of the development of man increased rapidly until it reached that mature state when it culminated in the periods of high civilisation in Egypt, in Babylon, Nineveh, India.

Pickering remarks that it is a mistake to suppose that the pastoral or nomadic life is a stage in the progressive improvement of society. Pastoral life is as much a stage in the development of man, as childhood is a stage in the development of the individual man; many individuals, however, remain in a state of childhood all their life, but this is the result of an arrested development, and of course is an abnormal state. In those widely extended regions which Pickering mentions, where cultivation is impossible, all progress in development is necessarily checked.

All species and races have their cycles of development. Like the dodo of the Mauritius and the apteryx of New Zealand, whose species are now extinct, many races of men have run through their cycle of development, and become extinct. Several races in Europe and in Asia, and several tribes in America, have died out, and have completely passed away.

Development of Nations. The history of nations and peoples is but a history of developments, each people having its cycle of develop-

ment. Egypt, Babylon, Nineveh, having run through their cycle of development, other cycles take their course of development, in Greece and Rome; the same rise, progress, and decay is repeated in Italy. England and France are now in their cycles of development.

The sequence of the several stages of development can be as plainly traced in nations as in the individual man.

Egypt may be adduced as the first instance of self-tuition and self-development in a nation; for we have no record that Egypt learnt anything from any other nation. Egypt had kings, princes, and a form of government; Egypt had developed the arts and sciences requisite for the conception and execution of the stupendous monuments and works of art still extant, for many thousand years, when many of the surrounding countries were in a primitive and pastoral state.

In India we see the course of progressive development more strongly exemplified; for India, locked in by the Indus and the Himalaya, laying far away and apart, where even the faintest echoes of Greece or Europe could never reach her, ran through its solitary cycle, and worked out its own development alone. India has a literature of poetry and philosophy which reaches back to the earliest times, older than Troy and the *Iliad*, older than the Pentateuch; there were Indian poets before Homer lisped his first song; there were Indian thinkers and philosophers before Thales called water the *αρχη* of all things.

That nations work out their civilisation independently, and go through their stages of development without connection, is exemplified also in the self-developed civilisation of Mexico and Peru, where the remains of cities, temples, and vast public works, erected by a people endowed with high intellectual acquirements, can be traced. There have been discovered a system of canals for irrigation, long mining galleries cut in the solid rock in search of tin, lead, and copper; pyramids not unlike those of Egypt; earthenware vases and cups; and manuscripts containing records of their history;—all testifying to a high degree of scientific culture and practical skill. Their calendars also present evidences of native and local origin. According to Mr. Fergusson, examples occur in Peru of every intermediate gradation in the style of masonry, precisely corresponding with the gradual progress of art in Latium, or any European country where the Cyclopean or Pelasgic style of building has been found.

There is no nation, however barbarous, which does not develop the germs of civilisation. Among the South Sea Islanders, when discovered by Cook, the applied sciences, if we may use the term, were not entirely unknown. They had observed something of the motions of the heavenly bodies, and watched with interest their revolutions, in order to apply their knowledge to the division of time. They were not entirely

deficient in the construction of instruments of husbandry, of war, and of music. Cut off from the influence of European civilisation, and deprived of intercourse with higher grades of mind, we still find the inherent principle of progression exhibiting itself, and the inventive and reasoning powers developed in the attempt to secure means of subsistence.*

It is a remarkable fact, that nature in the earliest periods, or, as we may say, in its infancy, was more active than in its later years, and produced more gigantic efforts than now. Nations, also, in their earliest periods were more active, produced more wonderful works, and executed structures which outvie in magnitude the boldest efforts of modern genius; as instances, we can mention the sculptured caves of Ellora, the Etruscan walls of Cortona and Fiesole, the Druidical circle of Stonehenge. When we recollect that these were the first efforts of the human race, made without pattern, designed without exemplar, commenced and carried out without experience, they cannot but give us a high idea of the energy and intellectual powers of man in the youthful stage of his development. As Dr. Wilson observes, "there seems to be an epoch in the early history of man, when what may be styled the megalithic era of art develops itself under the utmost variety of circumstances. It is one of the most characteristic features pertaining to the development of human thought in the earliest stages of constructive skill."

The age or degree of civilisation any nation has reached, may be inferred from the kinds of poetry, painting, architecture, that prevail at any certain time, which mark the stages of its development. Poetry seems to have taken its origin in a hymn of praise and thanksgiving to the Deity; this is its first stage; then comes the ballad or short mythic poem; next the epic, which is a descriptive poem; in another stage the lyric poem is evolved, which is the spontaneous overflow of powerful feelings, accompanied by music; next is the tragic poem, which combined a dramatic narrative with lyrical poetry; at a later period came the didactic; the satire argues a declining state of civilisation. The first attempts at painting were representations of animals, which were generally symbolical; then came rude representations of man, which progressed in different stages to its highest perfection. The same progress and stages of development are manifest in architecture, the styles and the ornaments varying according to the nation where it took its origin.

* This view of the civilisation of Mexico, Peru, and the South Sea Islands, must be qualified by considering that the American race can attain to civilisation in a certain degree only, and can never reach the refined and intellectual civilisation which can be attained by the Caucasian race alone.

The metre used in the early poetry of nations is peculiar to its stage of development. We find the ballad measure of the early poetry of nations the most remote from one another almost similar. The ballad poems of Spain and Germany contain many Saturnian verses. Indeed, as Macaulay says, there cannot be a more perfect Saturnian line than one which is sung in every English nursery—

“The queen was in her parlour eating bread and honey”.

Yet the author of this line, we may be assured, borrowed nothing from either Nævius or Archilochus.

History has been contemptuously called an old almanac. This is but too true; for as the moon, after having fulfilled its synodical period, comes round to the same point, its eclipses occurring in exactly the same order again, and an almanac of a past year can be used for the present year, so frequently the actions and events of past years are repeated, and history can teach us to follow the sequence and order of recurring events. We find an instance in the history of the French revolution. The sequence of events in the French revolution may be placed side by side with those of the English revolution. The stages of the progress of intellectual development were almost similar in England and in France. In France, indeed, the development was later; but, as Buckle says, when the development had fairly begun, the antecedents of its success were among both peoples precisely the same.

Development of Early Races. The similarity of the earlier productions of art among different peoples is but the result of the suggestions and inspirations of an universal instinct peculiar to our common nature.

Two useful instruments are found amongst early nations the most remote from one another, as the invention and suggestions of necessity, without being communicated from any other nation—the plough and the potter's wheel.

The weapons, tools, instruments, ornamentation, pottery, of each stage of man's development, are almost similar in all countries. The flint implements of the gravel drift found in England, are almost similar to those found at Abbeville, and St. Acheul, in France. The stone implements of Denmark, Ireland, France, New Zealand, Mexico, Teneriffe, are almost identical. The pottery of this age is very much akin, the ornamentation on it being also very similar. The tools and weapons of the bronze period in Ireland, Denmark, Italy, America, bear a distinct analogy to one another. The settlements of the bronze period in Switzerland are marked by tools, ornaments, pottery, closely resembling those of the same age in Denmark.

The flint axes found in the gravel drift are evidences of a still earlier development, than the stone period, of the suggestive principle in man. According to Mr. Evans, the flint weapons found in conjunction with elephant remains, imbedded in gravel, overlaid by sand and brick earth, present no analogy to the well known implements of the so-called Celtic or stone period. They have every appearance of having been fabricated by another race of men, and are on a much larger scale, as well as of ruder workmanship. They are thus evidences of a much earlier stage of development, and of an age of ruder strength, and of still more infantine skill; perhaps too, of an earlier species of a human-like race, a connecting link between the pithecoïd and the human species, of which the Neanderthal skull may afford a specimen.

In Mexico and Teneriffe, obsidian has been found in great quantities. Its presence has suggested its use for similar purposes. The Mexicans used obsidian for hatchets, similar to those used by the Gauls and the South Sea Islanders. It was also employed for knives, sword-blades, etc. In like manner, the Guanches (the ancient inhabitants of Teneriffe) fixed splinters of that mineral to the end of their lances. In both countries this variety of lava was employed as an object of ornament. Obsidian, jade, and Lydian stone are, Humboldt remarks, three minerals, which nations ignorant of the use of copper or iron have in all ages employed for making keen-edged weapons.

In studying the manners and customs of savage nations at the present day, and the instruments they use, we find a reflex of the habits and mode of life of our own rude ancestors, and a means of better comprehending the uses some instruments are applied to, and the solution of many things unexplained with regard to their habits and customs.

In the early stages of the development of nations, uncultivated minds have rude tastes. Hence there is a remarkable resemblance in the taste for ornament in their early stage. The ornamentation and decorations which are the objects of their taste are almost similar in the likeness they bear to one another and in their rudeness. In the earliest or barbarous stage we find a fondness for the zigzag meander fret, or such ornament as we find in the clubs of the South Sea Islanders, or in the very early Greek races. Similar designs adorn the common pottery at Maypuré, on the banks of the Orinoco; they ornament the bucklers of the Otaheitan; the fishing implements of the Esquimaux, and the walls of the Mexican palace of Mitla; for there is a tendency in the mind of man in the infancy of nations to take a sensible pleasure in the symmetric repetition of the same forms, and an inclination to follow a rhythmic order in its rudest essays of

poetry and song, as well as in its earliest attempts at ornament. In the next stage, a taste is evolved for the rude representations of animals, as we see in the early sculptures of Nineveh, and in the Greek and Etruscan vases. In the development of the architecture of the middle ages there is a coincidence of tastes, another cycle of development beginning its course. In the early period we find the same zigzag moulding, and later the same taste for the rude representations of animals.

In several ancient countries we find reminiscences of an earlier race, which seem to have been the primitive agricultural inhabitants of the soil, such as the Aryans in Asia, the Pelasgi in Greece, the Toltecs in Mexico. According to Muller, the Aryans, who were the ancestors of the Indians and Persians, who spoke a language not yet Sanscrit or Greek, but which contained the germs of all, led the life of agricultural nomads. They knew the art of ploughing. They had domesticated the most important animals—the cow, the horse, the sheep, the dog; they were acquainted with the useful metals. The etymological signification of Arya, he adds, seems to be “one who ploughs or tills.” The Pelasgi, the aboriginal race in Greece, were famous for their agricultural skill. The Latin words which are expressive of the events or simple relations of a pastoral, agricultural people, such as *pater*, *mater*, *atrarium*, *bos*, *ager*, can only be ascribed to the Pelasgic colonisers of Italy. With regard to the Toltecs, Prescott writes that they were instructed in agriculture, and in many of the most useful mechanic arts. In the early periods of Peru, Manco Capac, the Child of the Sun, entered upon his beneficent mission among the rude inhabitants of the country by teaching the men the arts of agriculture. Tacitus also describes the ancient Germans as agricultural nomads.

The lake habitations, or, as they are called in Ireland, *crannoges*, used by the primitive races of men in their early stage of development, are evidences of man under similar circumstances having recourse to similar expedients. The necessity of security, among the early savage peoples, suggested to man in that state of warfare the expedient of forming his abode or dwelling in lakes at some distance from the shore, thus obtaining security and freedom from attack. These are found among peoples widely apart; they were constructed by a Thracian tribe dwelling in Prasias, a small mountain lake of Pæonia, as described by Herodotus. They are found in Switzerland, in Ireland, and among the Papoos of New Guinea. The Swiss lake dwellings are, as Mr. Rawlinson remarks, the work of a race who formed for themselves habitations almost exactly like those which Herodotus describes.

The so-called raths in different parts of Ireland were, like the enclosures by the Indian tribes, formed for similar purposes of security, and for stores for grain in the early ages in pastoral countries. The so-called raths are always found in wide pasture grounds.

Development of Language. Language is the result of progressive development, originating in the attempts of man to express his wants by articulating sounds suggestive of the thing signified. Language, in its earliest stage of development, was monosyllabic, such as used by the Chinese, and is a form into which human discourse naturally, and as it were spontaneously throws itself. Language in its more complete and grammatical form, or the relation of intelligible sounds to one another, is the result of mind in a more advanced stage of man's development. Language, like other developments of instinct and reason peculiar to man, is evolved independently by the divers races of man.

The monosyllabic is the child stage of the development of language. The Chinese is the child language of the human race. The stages of the progressive development of language are the *radical*, the *agglutinative*, and *inflectional*. Some nations, however, have adhered to, and still retain their language in its earlier stage of development. The Chinese and the Turanians have rigidly retained each their language in its earlier stage; its normal progress of development was thus arrested. The Chinese language is still in the radical stage, the Turanian in the agglutinative. The inflectional stage, as among the Aryans, is, it is evident, the most perfect stage of the development of language. To reach this perfect stage, language must pass through the earlier stages of radical and agglutinative; as Müller remarks, we cannot resist the conclusion that what is now inflectional, was formerly agglutinative, and what is now agglutinative was at first radical.

The instinctive utterances of man in his earliest stage of development, when attempting to give articulate expression to his thoughts and feelings, form the primitive roots and germs of language; for instance, the root "pa," to feed, is one of those instinctive utterances from which many words may be developed. As a further instance of instinctive utterances, forming the same roots in nearly all languages, we may give the words "po" (father) and "me" (mother), in Siamese. As Sir John Bowring remarks, these two sounds, or something approaching them, being the first lisings of infancy, may be found indicating the parental relations in almost every language of the world. The root "ar," which means to plough, to open the soil, is another instance of instinctive utterance forming the germ of many words.

The so-called Aryan roots are nothing but the first instinctive utterances of man in the earliest stage of his development, and are con-

sequently the germs of language in all countries. The similar construction of remote languages is the result of the laws of the human mind, which are similarly developed in man, dwelling however widely apart, and by which, in the process of the construction of language, similar words and forms are independently evolved. For example, a savage owning a horse, to which he gives a name, forms a nominative case. Considering himself as owner *of a horse*, he forms a genitive case. Wishing to give something to eat *to his horse*, he forms a dative case. Announcing himself as owner of a horse, he says, "I have a horse"; thus he forms an accusative case. A verb may be evolved in a similar manner.

Language has its stages of development, its progress, maturity, decline, and extinction. Bunsen remarks that—"We shall take it for granted as a general principle, flowing from a very simple and therefore universal law, that the substantial or particle language is the most ancient possible, and that the relative position and succession of the other languages will have to be made dependent upon its degree of development. The less developed language will have branched off from the original stock at an earlier period than that which presents a higher degree of development. This forms the ascending line of development. When the language has arrived at its culminating point as to its forms, the descending line will begin, which is a gradual decay of those forms. The languages of the emigrating tribes, if we possess early documents, will show us the state of development of which they are as it were the deposit, and which decide the place they are to occupy in the general scale."

Each branch of language represents the stage of development language has reached. The Chinese or monosyllabic, the Turanian or agglutinative, the Aryan or inflectional, represent the stages of development of the Indo-European branch in the ascending scale.

In the opinion of Bunsen, the Chamitic, the Chaldee, the Hebrew, are the representatives of the stages of the development of the Semitic branch of language.

According to Müller, the Tungusic, the Mongolian, and the Turkic are the stages of development in the ascending scale of the Turanian languages.

An important indication of the stage of development a nation has reached is the form of its language, or its modes of expressing words and ideas. The radical form of language as among the Chinese, and the agglutinative as among the Turanians, are proofs of early stages of development. The picture writing of Mexico is an evidence of the Mexican nation being in an early stage of development.

That the varieties of language are the result of the independent de-

velopment of speech in man, we have the confirmatory opinion of Agassiz: his words are—"As for languages, their common structure, and even the analogy in the sounds of different languages, far from indicating a derivation one from another, seem to us rather the necessary result of that similarity in the organs of speech which causes them naturally to produce the same sound. Who would now deny that it is as natural for men to speak as it is for a dog to bark, for an ass to bray, for a lion to roar, for a wolf to howl, when we see that no nations are so barbarous, so deprived of all human character, as to be unable to express in language their desires, their fears, their hopes?

That there is an instinct or instinctive principle common to the human mind which teaches man to work out languages independently, we may quote a passage from Dr. Wilson, which is to the purpose. "By inflections as truly regulated by the science of grammatical laws as the language in which Plato wrote and Pindar sung, the wild unlettered Indian modifies each root-word or complex word sentence so as to express number, time, quality, or passions, as if guided by an intellectual instinct operating upon the reasoning faculty common to man."

Development of Religion. In religion, Fetichism is the lowest and earliest stage of its development. Fetichism is still found among the negroes, where supernatural powers are attributed to inanimate objects. In a further stage, man, experiencing the influence and mastery of the elements and the physical powers of nature over his actions, and feeling his weakness and incapability to resist their agencies, was led to propitiate and worship them. Then follows polytheism, when mankind, endowing these powers and influences with thoughts, feelings, and shape like his own, and attributing to them a will to do good and evil, was led to worship them as superior beings, and by sacrifices to them to obtain their good will and to avert their anger. Hero worship was also a development of this stage. In a later stage monotheism was evolved, attributing all might and creative power to one superior anthropomorphic being, such as the Brahma of India, the Osiris of Egypt, the Jehovah of the Jews, the Zeus of the Greeks. Its development proceeded onward, until it culminated in the sublime idea evolved by the Grecian mind of the Deity being the infinite intelligence (*vous*) pervading and ruling all things.

In the earliest stage of the development of man, adoration of the sun was an almost universal worship. Its representative, fire, also shared a similar extent of worship. Man, receiving his greatest blessings from the sun, showed his gratitude by the universality of the worship of that luminary. The proudest title assumed by the Pharaohs of Egypt and the Incas of Peru was "offspring of the sun."

Fire is the great civiliser. When man learnt to produce fire, he made a great step in his development; from its usefulness and from the benefits derived from it, man in gratitude worshipped it. For the same reason, gratitude for the benefits derived from them, rivers and fountains have been worshipped. The Indian worships the Ganges, the Egyptian worshipped the Nile. Fountains and wells are objects of veneration in many countries. These and other modes of worship are grounded in the instincts of mankind, and are evolved in accordance with the stages of man's intellectual development.

In the earlier ages of nations no adequate idea of God is developed but such as would be formed by a child. In the writings of Homer, and the earliest writings of ancient nations, we find no adequate conception of the divine nature but what we see in the case of children, diversified here and there by some happy surmise or solitary flash of truth. A purer conception of the Deity was formed in a later stage of development. Anaxagoras was the first among the Greeks who recognised the existence of a supreme intelligence directing and governing all things.

The mythology of various nations is nothing but the embodiment or giving human form and shape to the various physical agencies of nature. Such ideas seem to have arisen within the minds of, and have been suggested to, the people of various nations in their primitive state, this of course more or less modified by circumstances, such as the land they live in, the climate, the temperament.

The mythical origin of mythology would seem to be of later origin than the elementary. The mythical is but the poetical embellishment of the elementary. The mythical is the youth, the elementary, the childhood of the religious development of a nation.

The law of adaptation of every thing to its position in the world, is not only evident in the adaptation of the camel to the desert, the whale and the walrus to the northern ocean, but we may also adduce, as a wonderful instance of adaptation in nature, the eyeless fish (*Amblyopsis pellucida*) in the mammoth cave of Kentucky. Its eyes are covered by an opaque skin, or are entirely absent. The natural conclusion is, that, from the dark and gloomy habitat of this singular fish, the power of vision being unnecessary, nature, which adapts every living creature to the mode of life assigned to it, has withheld a faculty which would serve no purpose in the economy of its being. The appearance of eyes is preserved in obedience to the law of uniformity in nature, as paps are in man.

STAGES OF DEVELOPMENT.

| Man as Individual. | Man as Race. | Man. Mind. | Language. | Weapons. Tools. | Religion. |
|--------------------|--------------------|--------------|---------------|-----------------|-------------------------------|
| Childhood | Turpe pecus | Theological | Radical | Flints of the | Fetichism |
| Youth | Hunter | Metaphysical | Agglutinative | drift gravel | Polytheism |
| Manhood | Pastoral | Positive | Inflectional | Stone | Idea of Deity |
| Old age | Agricultural State | | | Bronze | as superior |
| | | | | Iron | anthromorphic being |
| | | | | | Idea of Deity as supreme mind |

THE IMPORTANCE OF METHODICAL CLASSIFICATION
IN AMERICAN RESEARCHES.*

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ASSEMBLED for the instruction of a purely American society, we must commence by rendering unto Cæsar the things which are Cæsar's. The idea of originating this Society does not belong to us; we only continue the undertaking with the concurrence of its learned promoters.

About five years ago, one of our most distinguished young scholars, M. Léon de Rosny, now professor at the Imperial Library, and M. l'Abbé Brasseur de Bourbourg, a missionary and traveller, well known for his important works upon Mexico, struck with the neglect of Europe towards America, conceived the desire of accomplishing for the New World what had long been effected for Asia and other eastern countries, by bringing into one centre all works treating upon America. At that time there was not an American society in Europe; even England, which had so often led the way in science, and discoveries of all kinds, had not conceived the idea of establishing it. Messrs. de Rosny and Brasseur de Bourbourg, with the assistance of many members of the Institute and others, feeling the time most favourable for the institution of such a society, set themselves earnestly to the task, and from the masses of statistical and topographical information, scattered or buried in unappreciated volumes, compiled their admirable works.

* This address was delivered to the Comité d'Archéologie Américaine de France by M. de Bellecombe, July 23rd, 1863. (Tr.)

One section searched amid the philosophic and religious traditions of America, to find, if possible, traces of a common origin with European people; another section entered into a comparison of the indigenous American languages with those of the three ancient continents; while a third explored the history of the country before the Conquest. One examined the national literature, another was devoted to the fine arts of Mexico and Peru, whose little known and poorly appreciated remains are still visible to travellers.

Such, in part at least, was the function of *La Revue Américaine*, established by M. de Rosny, a publication which has hitherto met with the most encouraging success, and has reached its eighth volume. Among its contents will be found papers of the greatest interest and research on the several subjects just mentioned.*

From 1858 to 1862 important articles appeared in the Review upon the American nations before the Conquest, throwing new light upon questions which, though still somewhat obscure, are certain one day to be elucidated.

Among these papers may be mentioned "Studies on the Constitution of the New World," by M. Charles de Labarthe; "Essays upon the Science of American Language," by M. l'Abbé Brasseur de Bourbourg; and "Central America and its Monuments," by the venerable Jomard, whose recent loss the learned world deploras. There are also the very curious papers of M. Aubin, on "The Didactic Painting and Figurative Writing of the Ancient Mexicans;" "America before its Discovery," by the Abbé Domenech; "Mexican Palæography," by M. Ferdinand Denis; "The Grammatical Elements of the Othomi Language;" "The Relations of the Ancient Americans with the Peoples of Europe, Asia, and Africa," by M. José Perez, and many other works, the enumeration of which would occupy too much time.

In consequence of the efforts of these learned men, the directors of the Musée Impérial du Louvre earnestly took in hand the subjects of American architecture and sculpture, and ancient America began to occupy an important place in our public galleries.

An American society is still a desideratum in the learned world. The present seems a most favourable time for its establishment, when we call to mind that the New World is brought nearer to us by the extension of the telegraph, and by the adoption of our system of military tactics in the conduct of that fratricidal war now unhappily dividing the Northern United States from the Southern provinces. There is also the important question pending between France and Brazil, as to the possession of the immense province situated between the Rio Grande and the Oyapoc, a country which

* The first series appeared under the title of "Revue Orientale et Américaine".

has been the scene of the struggles of our gallant soldiers* for the last two years, and the principal cities of which, Puebla and Mexico, have but recently yielded to our arms. On these and other grounds we are convinced that an American society is an institution not only useful, but highly necessary.

And now, suppose we succeed in founding such a society, what assurance have we of its duration? Our answer is that its permanence is beyond question, provided we heartily unite, and resolutely concentrate our powers, experience, and labours upon those distant lands, which are assuredly not more inaccessible to scientific investigation than they were to the destroying swords of the Spaniards.

Our desire to-day is to lay open this strange and mysterious America, with its legends historical and fabulous, its undeciphered monuments, its original manners and usages.

Having premised so much, we must now refer, as briefly as possible, to those subjects which will first occupy our attention.

Among all nations the primary inquiry should be as to their religion; after that follows the study of their history. Religion, though it throws no light upon the origin of the indigenous inhabitants of America, gives certain connecting links between these peoples and the inhabitants of Asia, Europe, and Africa. For instance, the Peruvians and Mexicans have their general and partial deluge. The four brothers Ayar Tapa among the Peruvians, Cortoz and Quitequetzel among the Mexicans, are the Satiavetra of the Indians, the Xizouthros of the Chaldeans, the Peroun of the Chinese, the Ogyges of the Greeks, and the Noah of the Bible!

The Kiouasa of Virginia is the Jupiter of the pagan Olympus. The Toia of Florida is the Christian Satan; the Zemes of the Antilles are the Darvans of Persia. Attabeira of Haïti is the Phrygian Cybele; the Mexican Theotl, Flacatekolototl, and Miclantemeli, form the Indian Trinity, represented by Brahma, Vishnu, and Siva; Vitzlipochtli, the Grecian Mars or the Gaulish Taran; Pachakamak is Apollo; Joalticiltl is the Lucinian Juno; Xintenchtlil is Vulcan. Polytheism prevails everywhere. There are gods of the air, of fire, of wind, of the heavens, and of the earth; gods of war, of peace, of evil, of good, and of justice; gods of the sun, of the moon and of the stars; of houses, of medicine, and of agriculture, of hunting, of fishing, and of travelling; in short, gods of everything, near or afar, which is supposed to influence the moral and physical state of man, all relating to a Great Spirit or Manitu, not less great, noble, or sublime than the Jehovah of the Hebrews.

The Peruvians and the other indigenous inhabitants of America, to whom the idea of the immortality of the soul became by some means

* The French army. (Tr.)

communicated, had, besides their rites and ceremonies, their human sacrifices.

I shall not dwell on the singular relations which existed, or are said to have existed between the primitive Americans and the navigators and travellers of other parts of the globe, because, with a spirit of partiality easily understood, these have been in all probability greatly exaggerated. There are curious resemblances between the races, the characters, the religions, and the languages of America and those of India, China, and Phœnicia. But the great question of the origin of the American races still remains for solution. In our opinion it would be rash in the extreme to take certain physical and moral resemblances in races or analogies and affinities in languages or religions, or certain philosophic tendencies, and on these to base the theory that Asia is the cradle of the Mexican people. Until the contrary has been clearly proved, we must continue to believe that the Americans are indigenous, and that the great southern migrations—the three great races, the Aztecs, Toltecs, and Chichimecs in Mexico, the Aymarás, under the command of Manco-Capac, in Peru—have all sprung from the same root, and are without doubt indigenous to America.

The course of all these primitive migrations being from north to south, it may be fairly inferred that the Americans of the south came originally from the north. It is in this part of the New World we must search for the original seats of the great indigenous races which inhabit it. It must be confessed, however, that the traditions of the north are little known, and that researches in that quarter are extremely difficult; but it is into the *unknown* that our labours lead us.

We shall next consider the judicial and administrative customs anterior to Columbus. And here we find a vast field opens before us; and Manco Inca among the Peruvians, Quetzaltcoatl among the Mexicans, are legislators and statesmen who cannot fail to excite our curiosity. The incomplete information we possess of Mexican legislation furnishes us, however, with some idea of the divisions and classes of the people. The nobles possessed honours, authority, and legislative powers, as well as military and judicial authority. There was a proud and haughty clergy, a labouring population, and a class of abject slaves. We find among the Mosquitos of Guatemala monarchy, with its aristocracy and hereditary peerage, its sovereign council of state; its laws and penalties for sacrilege—mild against the nobles, severe against the common people. And here we cannot help admiring the Peruvian custom which humanely equalised domestic labours and duties between the man and the woman, the husband and the wife.

As regards history, who were the people whom Columbus, Amerigo Vespucci, Cortez, Almagro, and Pizarro found in the New World?

In Brazil, the Tapayas or Tabaiaras claim attention for their resemblance to the Mongols in the colour of their skin and the form of their features, and the Tupis or Tupinambas for a Caucasian physiognomy. In Columbia, the Caribs or Caraïbs are cannibal hordes who inhabit the vast plains of the Caraccas, of Cumana, of Apure, and the Orinoco; they subsist by fishing and hunting, and on such wild fruits as they can gather. There are the Moscas or Muyscas of the plateau of Bogotá; in Guiana the Galibis; in Florida the Apalaches, who derive their name from the mountains of their country; the Natchez, on the banks of the Missouri and the Ohio; the Hurons, the Algonquins, the Iroquois, and the Altekamocs, in Canada; the Osages, the Delawares or Abenaco, in Louisiana; the unconquerable Araucaños, in Chile, whose last chief scarcely a year ago was one of our adventurous countrymen; the Charruas, the Guaranis, the Abipones, and the other tribes of Paraguay and of Buenos Ayres; the Aucas and the Puelches of Patagonia; the Fuegians of Tierra del Fuego; the Malouins and the other islanders; the Changuenes of Costa Rica, the Mosquitos, the Zambos, and the Poyais of Guatemala; the Quichuas, the Atacamans, the Yuaracaris, the Apolistas of Peru; the Tepanecs, the Olmecs, the Aztecs, the Toltecs, the Chichimecs, and the Xicalancs of Mexico. These are the principal peoples which were vanquished by the invading and conquering Europeans. What do we know of their history? Nothing more than some few characteristic facts, some unconnected episodes, some details more or less fabulous, to be found scattered in the histories of Ixtlixochitl, of Tezozomoc, of Balboa, of Zurita, or of Montesinos.

Thus, for instance, we read of the foundation of the Peruvian city of Cuzco, by Manco-Capac I, who flourished about 2,900 years before Christ; of the establishment by him of the first Peruvian government; and further, of the great wars of Sinchiroca, one of his successors, against the princes of Antigmalas.

Under the reign of Ayar-tarco-Cupo (about 4,000 years before Christ), we hear of the appearance of giants, and of the subsequent wars of Titu Yupangui, surnamed the happy or Pachacuti, against the Chimos. Then follows the downfall of the first religion under Cao-Manco, and its re-establishment by his successor Marasco, also surnamed Pachacuti (about 1,166 B.C.), the end of the first Peruvian dynasty consisting of thirty-two kings, 880 years before Christ; and about the same epoch the establishment of the second dynasty. We now come to the valuable astronomical discoveries of the learned kings Ayay-Manco, Capac-Rami-Amanta, and Toca-Corca-Apu-

capac; the first of whom reformed the Calendar, and introduced the intercalary days; and the second invented the scale of the solar hours; while the last discovered the equinoxes, divided the year into four seasons, and founded, it is said, the University of Cuzco. The appearance of many frightful comets in the reign of Huamantaco-Amanta presaged the dreadful wars and revolutions which distinguished the reign of his successor Titu-Yupangui Pachacuti VI, a prince contemporary with the Christian era.

With regard to the Mexicans, we possess a long list of their sovereigns and kings who reigned during the three following great epochs. First, the appearance of the Chichimecs in Mexico, under the command of their chief Chichimecatl, long before the Christian era. 2nd. The invasion of the Toltecs in the seventh century of the Christian era. 3rd. The overthrow of the Toltecs by the Aztecs in the twelfth century. These are the three great historical epochs, before the conquest of Mexico, but there are long periods to be filled up, ere we can reconstruct the national history of that country.

Mexican history becomes of real importance about the beginning of the fourteenth century. The Aztecs, driven out by Tula, took refuge in Anahuac, and restored Tezcuco, which, under the influence of its king, became the resort of all the poets, artists, and men of learning of the period.

Remarkable monuments adorned this populous and flourishing city, which subsequent Mexican historians delighted to call the Athens of Anahuac. The Acolhues united to their conquerors, the Chichimecs, and founded a city not less celebrated than that just referred to. It was known at first under the name of Tenochtitlan, and was founded on many low islands connected by solid dykes, and adorned by floating gardens, attached to the four quarters into which it was divided.

Disastrous wars broke out between the Chichimecs and the neighbouring tribes; the kings Acamiputzli, Huitziluhitl, and Itscoatl increased their territories and enslaved the Tlepanecs, after a memorable siege, which recalls that of Troy.

The reigns of Montezuma I and of Nezahualcoyotl are the most illustrious in the annals of Mexico and Tezcuco. Brave and warlike, Montezuma was elected king by the chiefs and princes, and rendered his reign remarkable by constant and successful wars against the revolted inhabitants of Chalcos, Oaxaca, and the Tepanecs. He prevented the inundation of Lake Tezcuco, and enacted many just and benevolent laws. He took the priests under his special protection, and made himself loved and respected by all. Nezahualcoyotl, his friend, not less worthy or remarkable, driven at first from his throne by his infuriated enemies, pursued from cave to

cave, from mountain to mountain, was at length restored by Itzcoatl, who, touched by his misfortunes and his courage, showed himself as great and generous in prosperity as he had been noble and resigned in adversity. Nezahualcoyotl executed some very remarkable works, encouraged commerce and agriculture, and published a penal code calculated to reach and punish all misdemeanours. He repressed tyrants and oppressors, and placed the poor under the safeguard of enlightened and impartial justice. Nezahualcoyotl is the David of Anahuac, and the history of his persecutions, his sufferings, and his providential restoration would form an American *Odyssey*. Axajacatl, his cousin, and his brothers Tixoc and Ahuitzotl, worthily preserved the sceptre of Montezuma I, and transmitted it formidable and respected to Montezuma II, whose reign, however, was fated to be extinguished by the redoubted and avaricious conquerors from Europe.

The sixteenth century opens with Ahuitzotl and Montezuma, who changed the destinies of the Chichimecs and of their vassals or tributaries. These sovereigns brought discovered America into an unforeseen relation with the people of the west, entailing war and oppression on themselves, and on their children abject slavery.

From history we proceed to consider the indigenous languages.

In Brazil, the three principal languages spoken are the Guarani, Tupi, and Brazilian. They are defective in the sounds *f*, *l*, *r*, *s*, and *v*, as these are found in the Portuguese, and are the three chief dialects of which we have grammars and dictionaries.

The Aztec or Mexican is less sonorous than the Incas, as distinguished by the length of its words, the varieties of its meanings, and the absence of superlatives. Among the Toltecs there are few monosyllables, but there are words of not less than sixteen syllables, in which we do not find the consonants *b*, *d*, *r*, *g*, and *s*.

There are many other languages among the Mexicans, of which fourteen have grammars and dictionaries. These are the Othomi, Tarasco, Zapotec, Mystec, Maya (of Yucatan), Totonac, Popoluc, Matlazingue, Huastec, Mixe, Catchiquel, Taraumare, Tepehuane, and Core.

The Peruvian language is in two divisions, that of the nobles or Incas, a species of masonic language spoken only by persons of the highest rank; and the popular or common tongue used by the lower classes, but known also to the nobles and aristocracy.

These indigenous tongues have not been replaced by those of the European conquerors. In Guatemala, says the Abbé Brasseur de Bourbourg, in his *History of the Civilised Nations of Mexico*,* the indigenous language or Maya is used by the Spaniards in preference even to their native tongue. In Mexico the Spanish language has

* Histoire des Nations Civilisées du Mexique.

not preserved its Castilian purity, for we find words entirely Aztec mixed up with it. We may remark that Latin outlived the eruption of the barbarians, and was preserved for centuries in Gaul, Spain, and Africa, notwithstanding the prevalence of the Frank, Visigoth, Ostrogoth, and Vandal languages.

We may infer from the various dialects of Guatemala, says the Dominican Francisco Ximenes, in his *Arte de las tres lenguas catchiquel, quiche y tzutuhil*, that all are derived from one, which has been corrupted in various ways in different provinces, but the roots of the verbs and the substantives are found for the most part to be the same. This mother tongue is the Maya, according to the learned Dominican and the Abbé Brasseur de Bourbourg, both most competent judges on such a question. Canon Ordoñez inclines to the Tzendal, but this may arise from a natural partiality, this being the native language of the canon.

The classification of the indigenous languages of America would be a great service rendered to philology, and would lead us to the study of indigenous literature, sciences, and the fine arts. We must remember that America has a literature of its own, which still remains to be investigated and studied. The Aztecs, says Clavigero, were good poets and distinguished orators. The poets, held in great esteem at Tezcuco and at Tenochtitlan, chose warlike and religious subjects; while the priests, whose minds were more cultivated than the majority of these poets, celebrated the firmament and the heavenly bodies, the feats of kings and of heroes, and the duties and attributes of man. Oratory was much taught among the people, and the young men were early accustomed to take part in discussions on the affairs of the nation. The Aztecs had even a theatre, but their dramatic literature was weak and coarse, and was degraded by foul and brutal exhibitions.

M. l'Abbé Brasseur de Bourbourg mentions, in terms of the highest commendation, a historical MS., written in the Nahuatl language in 1528, by one of the bravest and most faithful officers of the unfortunate Quahtemotzin.*

The epoch of the conquest, followed by the preachings of the missionaries, brought about a new era of revival in the national literature. Several natives taught by the priests, and following the example of Quahtemotzin's officer, began to write their ancient chronicles in the Nahuatl language. In 1736, the Chevalier Boturini Benaduci, says M. Aubin in his article† on "La peinture didactique et la langue idéographique des Aztèques," had made a very remarkable and valua-

* This MS. is now in the possession of M. Aubin.

† In the *Revue Orientale et Américaine*, vol. iii, p. 226.

ble collection of these manuscripts. Unfortunately, on his way back to Italy, he was captured at sea by the English, and plundered of everything. Thus, the fruits of all his labour and research were lost to this intrepid traveller, nor has more than the eighth part of these MSS. been found, and that but recently.

Many native and European *savants*, the Mexican historian Veytia, the American astronomer Gama, Alexandre de Humboldt, Ternaux-Compans, and others, have endeavoured to repair that immense loss. At last, M. Aubin, after long and patient researches, has succeeded in bringing together a rich and important collection; and, from the indications furnished by the Chevalier Boturini's catalogue, has been able in a great measure to reproduce the precious originals.

We may judge of the importance of this new indigenous literature by the mere names of some of these manuscripts, now in the possession of the enlightened and industrious ethnographer whom we have just named. Among these MSS. are the following:—Essays on Mexican history in the Nahuatl language, from the year 1064 to 1521, by Domingo Chimalpaïn.—The historical annals of the Mexican nation in Nahuatl, dated 1528, which is probably the MS. previously mentioned by M. l'Abbé Brasseur de Bourbourg.—Several original histories in Nahuatl of the kingdoms of Culhuacan, Mexico, etc., from the most remote period to 1591, by Domingo Chimalpaïn.—And finally, the history of the same kingdoms of Culhuacan and Mexico, by a native author using the *nom de plume* of Fernando de Alba.

There exist also numerous works in Mexican by foreign missionaries, among which we shall notice the translation of the Epistles and of the Gospels in Nahuatl by Arnaud de Bassac; *The Colloquies of Christian Peace*, by Father Juan de Gaona; *The Art of the Mexican Language*, by Jean Foucher, a Frenchman; together with the learned and numerous works of Andrès de Olmos in Mexican, Huaztec, Tolonac, and other languages.

The indigenous chronicles cited by M. Aubin are generally concise, though they exhibit traces of oral traditions and of historical songs often repeated word for word in the same work.

The Peruvians cultivated, also, poetry and the drama, which appear among them to have reached a higher degree of perfection than among the Mexicans. Comedies and tragedies were performed in the presence of the Incas and their courtiers, and were usually heroic, mystic, or warlike. Love was always predominant in Peruvian poetry, and fragments of that poetry are quoted by Father Blas Valera, in his memoirs, as well as by Garcilasso de la Vega. But Peruvian literature, less fortunate than Mexican, is still shrouded under a dark veil.

Science among the nations of America took the precedence of literature, possibly on account of its greater utility. We have already seen that astronomy especially was the constant study of the Incas, the Caciques, and the priests of Peru, of Mexico, and of Guatemala. Montezuma I and Nezahualt were remarkably skilful and enlightened engineers, who immortalised their names by the construction of the famous dykes destined to repress the inundations of Lake Tezcucuo. These princes, though bad tacticians and strategists, were by no means ignorant of the art of attacking and defending cities; in fact, traces of Mexican fortifications are still visible, which show considerable knowledge of these subjects.

Agriculture, very ancient among the Aztecs, was wanting in those almost indispensable adjuncts oxen and ploughs. Men performed every labour of the field with their own arms, and their barns were rudely constructed with trunks of trees placed over each other, and then firmly bound together. They had, however, singular skill in the construction of those floating gardens, or chinampas, which had a vegetation so luxuriant as to call forth the admiration of the conquerors themselves. Agriculture among the Peruvians was very differently organised. It is true that the use of the plough was equally unknown to them; but they dug up canals for the irrigation and fertilisation of the lands; they constructed roads and ways of communication,* bridges, and embankments; and reared numerous flocks of lamas and alpacas. They also exhibited considerable skill in the construction of their houses, distinguishing themselves especially by the erection of numerous aqueducts, preserved and used by the Spaniards for a long period after the conquest.

Arithmetic and medicine formed a part of the scientific knowledge of the Peruvian, but as to the latter, his remedies were very simple and very limited, and administered without method or discernment. Finally, the Aztecs and the Quichuas had their painters, sculptors, goldsmiths or jewellers, their architects, actors, dancers, and musicians. In all the great towns of Anahuac, vases of gold and silver were manufactured before the conquest, and Cortez, in a letter to the Emperor Charles the Fifth, praises the skill of the goldsmiths of Tenochtitlan. Among the Mexican monuments found by the conquerors, the most remarkable were the two great pyramids called "houses of the sun and of the moon," situated in the Plain of the Dead (Micoatl);† the pyramids of Papantla and of Cholula (the latter

* Among others, the high road from Cusco to Quito.

† A gentleman who visited Mexico in the year 1851, informs me of an interesting discovery made by him in connection with these pyramids. Observing midway between them a large square block of granite lying on its edge, and partly imbedded in the sand, he, with the aid of several servants, succeeded in remov

one hundred and seventy feet high); the monument of Xochicalco, known by the name of the House of Flowers; and many palaces, temples, and altars destroyed in Mexico and other chief towns.

Sculpture and hieroglyphic painting were also in great esteem among the natives of Mexico. The sculptures generally represented the images of gods and other fabulous creatures, of kings and men of note, and even of animals of the most fantastic appearance. Respecting the hieroglyphic pictures, I could not do better than refer to the excellent work of M. Aubin, published in the first series of the *Revue Américaine*.* It is at once a special and almost complete document on this subject.

Notwithstanding that Mexican architecture and sculpture seem now to be regarded with some degree of disfavour, I have heard M. l'Abbé Brasseur de Bourbourg himself say that the Anahuac contains monuments of the ante-Spanish period, remarkable both for art and for execution.

That Peruvian architecture is much finer, is proved by the vestiges of the temple of Pachacamac, of the palace of the Inca, and of the fortress of Cusco, as well as by the imposing ruins of Atun Cannor, mentioned by La Condamine. Several statues may also be mentioned, which have been preserved in spite of the deformity of the legs and arms. There are also many vases, discovered in tombs, which, in the opinion of M. d'Orbigny, exhibit a knowledge of drawing, truth, and finish, in the figures represented.

Dancing was a favourite amusement with the natives of Peru, each province having its particular and characteristic dance. It must be admitted that their music was wanting in variety, and had little to recommend it. They knew nothing of any instrument except a flute with five pipes, which was indifferently used for songs of love, mourning, or triumph. Songs of triumph were generally confined to their solemn and periodical festivals. On these occasions choirs of men and women added their voices to the flute, and celebrated the high deeds of arms of their relatives or fellow-citizens. It may be added, that dancing and music were equally known to the other nations of Southern America.

Such are the principal studies and researches you will have to

ing a sufficient quantity of the soil to admit of its being turned over to a slight extent. After some scraping, my friend found a distinct image of the sun cut on what appeared to have been originally the top of the block. There is no doubt that this piece of granite, weighing some tons, formed at one period the apex of the pyramid or "house" of the sun. (W. H. G.)

* Vide *Revue Orientale et Américaine*, vol. iii, p. 224; vol. iv, pp. 33 and 270; vol. v, p. 361. The continuation of this important work will be published in the new series.

make in connection with America anterior to its discovery. There are others which, although posterior to it, are not less interesting and important.

The history of the conquest is extensive and satisfactory; but that of the two centuries which followed it is quite unknown. Under the Spanish, Portuguese, and French domination, there is an immense blank, which it is important to fill up as soon as possible. The history of the moral, physical, and intellectual state of the vanquished under the yoke of these conquerors, still remains to be composed and written. The great question of slavery, which occupies, and must continue to occupy, the minds of men, will doubtless find important elucidation in the filling up of that huge gap just indicated. It is of vital importance to follow the native peoples in their continual and consecutive relations with those nations which have subdued them.

There still remain many capital questions to be treated of in detail. We will call particular attention to the original and striking manners of ancient and of contemporary America.

Forward, then, courageous explorers; forward, bold missionaries of the Rocky Mountains; forward, travellers, daring pioneers and colonisers of the prairies of North America; forward, thinkers and philosophers, *savants*, writers, artists, and poets;—onward all of you to delve in that immense mine, which must be worked up into its innermost recesses, into its most imperceptible furrows, into its most impenetrable crevices!

Christopher Columbus and his worthy imitators discovered the material and physical America—the America of flesh and bone, of earth and marble. It remains for us to discover another America—a moral and intellectual America; America of soul and of heart, of mind and of genius.

ANTHROPOTOMY.*

It has been our duty to watch this work through the three successive editions which have been published of an undertaking which has been justly characterised by Professor Owen† as “a deservedly esteemed

* *Anatomy; Descriptive and Surgical.* By Henry Gray, F.R.S., F.R.C.S., Lecturer on Anatomy at St. George's Hospital Medical School. The drawings by H. V. Carter, M.D. The dissections jointly by the Author and by Dr. Carter. Third Edition. By T. Holmes, M.D. Cantab., Assistant-Surgeon and Lecturer on Anatomy at St. George's Hospital. 8vo. London: Longmans. 1864. Pp. 788.

† On the Cerebral Characters of Man and the Ape, *Annals and Magazine of Natural History*, 1861, vol. vii.

compendium of descriptive anthropotomy". Its celebrity as the most convenient general text-book, suitable for constant use, has been long an accepted fact; and we shall not in this place dilate on the advantages which a modern anatomical tyro possesses by the study of so handy a manual. But the relations which teaching on this, as on other anatomical topics, bear to modern anthropology, demand a few words on our part; criticising the state of the science in England, ornamented by such names as Humphry, Holden, Ellis, and Holmes Coote, each of whom, as well as many others, have contributed to the advancement of integral branches of English anthropology. The editor of the present work states that his excuse for not inserting a chapter on the rudiments of scientific, as distinguished from descriptive anatomy, must be owing to the fact that the examining bodies do not exact a knowledge of this branch of science as a necessary part of medical education. We scarcely coincide with him in this being a justifiable defence, but are so pleased to have the third edition of this elegant text-book placed before us in a convenient form, that we are not inclined to criticise too severely that which we must, however, consider an important omission. Every anthropologist, whose duty it must be to compare the structure of the different races of men with the characters of the ordinary European anatomical subject, should possess this work: even the professed human anatomist will find it easy of reference, when the consultation of the many other higher and more profound works on the subject would be impracticable or inconvenient. The two first editions have, however, been so popular, that it becomes an easy task to call the attention of our readers to a few of the excellencies of the third. We shall merely indicate a few of the bearings of the present work on modern anthropological discussion. Without entering into the details of a controversy which has elsewhere been carried on respecting the true "typical" or "normal" number of cusps in the lower molars of various races of mankind, we fear that the present work will scarcely be satisfactory to either party in the controversy. The statement (p. 619) that the crown, in the *dens sapientiae* is "furnished with three tubercles", is one which, although in one sense justifiable, yet if placed *simpliciter* before an unwary student, may lead to considerable misapprehension.

Contrasting such a plate as that which appears on p. 69 of this work with those ordinarily promulgated in anatomical text-books, and giving due credit to the beauty of the engraving and accuracy of detail which are here manifest, we must suggest that a vertical bisection of the skull should be drawn in any future edition of the work, on the same plan as those of the Papuan, gorilla, and oran-útan, which

illustrate Owen's paper in the *Zoological Transactions*. The English anatomical student is scarcely yet as familiar with the mode of investigation by vertical bisection and internal measurement as the Dutch students were fifty-four years ago, in the days of Crull. The use of such works as Gray's *Anatomy* will in time, however, produce the desired effect.

Several omissions may be signalised, in some of which "Gray" does not reflect the tone of modern anthropotomical study so much as "Holden". Thus, on p. 137, the reader who carefully peruses the otherwise excellent account of the *fibula*, is not duly made aware of the signification of the "styloid process". It is all very well to tell us that "it gives attachment to the short external lateral ligament". Such a definition would have been satisfactory in the days of *South on the Bones*, or of some other far less useful compendium; but the student in 1864 imperatively demands other and more complete information. The fact of the serial homology of this process with the "olecranon" of the *ulna*, and of the important part which it plays in such animals as the *Phascolumys*, in which it is developed as a separate osseous element, are at least worth teaching to the modern anthropotomist, if we wish to avoid the miserable repetitions of unintelligible mediæval Latin terms which distinguished the majority of the old osteological writers. Every student of man, who considers any part of his physical structure, will put the following question: What relation does this part bear to the homologous part, if there is one, in the lower mammals? and ultimately the anatomical treatises which neglect to afford the desiderated information will be relegated to the top shelves, beside Vesalius and the alchymists.

The 64th page of this edition gives us a most interesting and correct diagram, which originally appeared in the second edition, of the forms of the lower jaw in the young, at puberty, in the adult, and in the aged individual. In this series the method by which the angle of the mandible is developed is exhibited, showing the open angle of the adolescent and of the aged subject to be alike obtuse, forming a striking contrast with the acute right angle at which the ascending joins the horizontal ramus in the adult. Comparison of such drawings as these with a large series of lower jaws, will lead the observer to some remarkable conclusions, the most striking of which is, the *general* resemblance which prevails between the lower jaws of many Negroes and Australians, and the homologous part in young Europeans. Before, however, this can be laid down as a generalisation, an enormous series of specimens must be diligently collected together, and the many striking exceptions to the rule pointed out; and we believe that some interesting researches on the subject will be laid before the Anthropological Society during the next session.

In the Halford *versus* Thomson controversy at Melbourne, Gray's *Anatomy* has been triumphantly cited by the victor in the strife, as giving a most lucid and intelligible account of the lower insertion of the *tibialis anticus*. It is surprising that any doubt could have existed as to these facts. Turning, however, to the subject of the dispute which arose in the Zoological Section of the British Association,* it is noticeable to remark that the words used by Dr. Gray with respect to the origin, course, and insertion of the *flexor longus pollicis*, are such as convey no idea of farther divarication of its distal portion than as follows :

"This tendon passes through a groove on the posterior surface of the tibia, external to that of the *tibialis posticus* and *flexor longus digitorum*; it then passes through another groove on the posterior extremity of the astragalus, and along a third groove, beneath the tubercle of the *os calcis*, into the sole of the foot, where it runs forwards between the two heads of the *flexor brevis pollicis*, and is inserted into the base of the last phalanx of the great toe. The grooves in the astragalus and *os calcis* which contain the tendon of the muscle, are converted by tendinous fibres into distinct canals, lined by synovial membrane; and as the tendon crosses the sole of the foot, it is connected to the common flexor by a tendinous slip." (P. 314.)

This statement may be contrasted with that in the *Edinburgh Review* (April 1863).

"In addition to this structure, the grasping power of the foot of the gorilla and orang is strengthened in a very peculiar manner. Every anatomist knows that the muscle termed *flexor longus pollicis pedis* originates from the lower portion of the outer bone of the leg or *fibula*, and that its solitary tendon passes along the sole of the foot, and is eventually inserted into the base of the last joint of the great toe. The whole force of the muscle is here concentrated; and the dancer who pirouettes on tiptoe exhibits a striking example of the power and force of this muscle in man. When we turn, however, to the foot of the orang, a totally different structure presents itself. The homologous muscle there is terminated in three tendons, each of which is inserted in one of the three middle toes, forming a beautiful grasping organ, wherewith the orang ascends the highest trees in Borneo. . . .

"When we turn to the gorilla, the homologous muscle divides into three slips, the first and smallest is attached to the third joint of the great toe, the second slip is attached to the third joint of the third toe, and the third slip is attached to the third joint of the fourth toe. It will be obviously seen that the second and third slips in the gorilla have no direct representative in man. They are essentially climbing, and not standing, muscles." (P. 551.)

The above popular exposition has been criticised as if it necessarily contradicted the facts, made known to us by Church and Turner, re-

* Anthropological Review, vol. i, p. 457.

specting the frequent diversion of branches of the tendon of the long flexor to the second and third toes. Critics will do well to refer to the elegant and lucid description of Gray, which comprises the sum of the known facts before us.

The woodcuts in this work are especially beautiful; and we would select for approval those which relate to the nervous centres, which are far superior to the illustrations of the same sort in any English work familiar to us; although a comprehensive series of diagrams, after the plan of the excellent ones devised by Mr. W. H. Flower, might advantageously have been introduced.

Perhaps, however, in spite of the drawback to which we have above alluded, the best part of the work is that relating to osteology; and, while turning over the pages, we were forcibly reminded of a very curious consideration dependent on the state of anatomical teaching in England. It may not be generally known that a very large proportion of the specimens on which anatomical students "study the bones", and which they fondly imagine to be those of their compatriots in Europe, or which perhaps may be labelled in some anatomical museums as "English", are really the relics of departed Africans. These specimens are now imported duty free, as "objects of natural history", through France, in large quantities. We are unable to trace their history further; and we prefer not to offer any conjecture as to the origin of a practice which ultimately may seriously bewilder the minds of those students who, anxious to draw monogenistic conclusions, are unable to see any real specific difference between the skeletons on their own tables, and those unmistakable and recognised Negroes who are to be found in the public museums.

The last number of the Proceedings of the Royal Society contains the abstract of a highly important paper by John Wood, Esq., F.R.C.S., Demonstrator of Anatomy in King's College, London, in which the results of fifteen years' observations on more than six hundred subjects are embodied.

"The author classifies these muscular variations as follows, viz.:—

"*Variations with redundancy.* 1st. Those which have an origin in a development totally independent of any other muscles or tendons.

"2nd. Those which consist of extensions or offsets from normal muscles or tendons, and of muscular fibres replacing tendons, and tendinous fibres intersecting muscles.

"3rd. Those which are formed by simple areolar separation or segregation of muscles.

"These are given in the order of their rarity, and of their comparative value in reference to the muscular anatomy of the lower animals.

"*Variations with deficiency.* 1st. Those produced by total suppression of the germs of muscles.

"2nd. Those resulting from amalgamation with neighbouring muscles.

"3rd. Those from atrophy or degeneration subsequent to their formation.

"All the illustrations belong to the former class, which supply the most fitting subjects for them.

"The frequency of varieties of all kinds in the human subject is very great. Few subjects are to be found entirely free from them. Muscular variations are rather more common in the male sex. In them, also, variations with redundancy calculated to increase muscular power, such as are classed in the second division of that section, are more common, but may be also associated in the same individual with anomalies from defect or diminution. The same individual is frequently found subject to more than one irregularity, a muscular irregularity of a marked kind being generally associated with several others. Probably the source is hereditary, as is undoubtedly the case with those which result in deformity. Muscular variations are more common in the arm, back, leg, and head, and least common, as a rule, in the abdomen, the groin excepted. They are generally more or less symmetrical, though often much more evident on one side than the other. Distinct developments are usually found on both sides. Variations by redundancy more frequent or more developed on the right side; those from deficiency on the left.

"*Variations by simple reduplication.* The following muscles have been observed double, or in two distinct layers:—Pectoralis major and minor; gluteus maximus; soleus; pyramidalis abdominis; pyriiformis; subclavius.

"*Variations by deficiency.* The following have been seen *totally* deficient:—Psoas parvus; palmaris longus; superior and inferior gemellus; extensor minimi digiti; pyramidalis abdominis; pyriiformis; peronæus tertius; extensor primi internodii pollicis; trapezius; plantaris and palmaris brevis (rarely).

"The following have been seen *partly* deficient:—Trapezius; omohyoid; sterno-hyoid; serratus magnus; internal oblique and transversalis abdominis; soleus."

Some of the other observed varieties are very singular. More than thirty-two examples are given, but we must only select a few, referring to the abstract of Mr. Wood's excellent paper (Proc. Royal Society, No. 65, p. 299) for further particulars.

"*Levator claviculae.*—Clavio- or acromio-trachelian, observed in two subjects, on both sides, arising with the *levator anguli scapulae* from the third and fourth cervical transverse processes, and inserted into the *outer third of the clavicle* under the trapezius. Found in all the ape tribe."

"Broad slips from *pectoralis major* and *latissimus dorsi*, passing across axillary vessels and nerves, and attached, low down the arm, to the aponeurosis inserted into the inner condyle of humerus and olecranon process. These slips are highly developed in some of the anthropoid apes; the former especially in the gibbon. The same

subject, a muscular male, shewed also a high and large origin of the *pronator radii teres* in common with the *brachialis anticus*."

"*Palmaris longus*, with inverted belly and double origin, the additional one (tendinous) from the oblique line of the radius above the flexor sublimis. Given off from it also is the *flexor brevis minimi digiti*. A precisely similar arrangement of this very uncertain muscle not before recorded. A somewhat similar arrangement found in the *Cebus* and *Magot*."

"Striking abnormality seen in two male subjects on both sides. A long tendon, with bulky, muscular belly above, arising from the outer condyloid ridge of humerus with the *extensor carpi radialis longior*, and inserted in one case into the base of the first metacarpal bone and origin of the *abductor pollicis*, and in the other passing entirely into the latter muscle. Not before recorded.

"*Extensor primi internodii pollicis et indicis*.—Arising by a distinct belly above the indicator, going along with that muscle, and giving off two tendons, one to be implanted outside the indicator tendon, and the other to supply the place of the *extensor primi internodii pollicis*. Not before recorded in the human subject. Found in the dog."

"In a hand from the subject before given in 9 and 17, all the dorsal interossei were arranged in two portions easily separable. In the first interosseous space the *abductor indicis* was very distinctly divided into a posterior part, arising in the usual manner, and inserted into the base of the first phalanx; and an anterior, arising from the first metacarpal, and inserted partly (by a small slip) into the second metacarpal, but chiefly (by a very distinct tendon) into the dorsal expansion of the common extensor tendon of the index. Not before recorded in the human subject. A similar arrangement found in the gorilla and other simiæ."

"Separation of the anterior fibres of the *gluteus minimus* into a distinct muscle homologous with the *scansorius* of Traill, or *inverter femoris* of Owen, found in the orang and others of the ape tribe."

"*Peroneus quinti digiti*.—In most instances a tendinous, but in one a fleshy offset from the *peroneus brevis*, below the outer ankle-bone to the expansion of the common extensor tendon of the little toe. Very frequent in the human subject, usual in the apes."

"*Tibialis anticus* tendon divided into three parts, going respectively to the inner cuneiform, base of metatarsal, and first phalangeal bone of the great toe. The last-mentioned offset not before recorded. Similar arrangement in the quadrumana."

"*Abductor ossis metatarsi quinti*.—A distinct muscle found by the author in more than one-half of the subjects in which he has looked for it, concealed by the outer part of the plantar fascia and *abductor minimi digiti* muscle, arising from the outer tubercle of the os calcis by a round fleshy belly, and inserted into the base of the fifth metatarsal by a distinct round tendon. Not before observed in the human subject. Found in the gorilla and chimpanzee by Huxley and Flower.

"*Opponens minimi digiti*.—Very commonly found, though not de-

scribed in anatomical text-books. Arises tendinous from the ligament of the fifth metatarsal and cuboid, and inserted in a bipennate way into the whole length of the fifth metatarsal bone. Found well developed in all the apes."

The consideration of these and many other interesting abnormalities should be postponed until Mr. Wood's paper shall appear at length in the Transactions of the Royal Society.

A CHRONICLE OF ENGLAND.*

ONE of the most beautiful, as well as the most elegant histories of England is before us, illustrated in a manner reflecting the highest credit on the artist, the chromo-lithographer, and the printer, and equalling the magnificent works of La Croix and Seré, Pugin, or the costly productions of the foreign historiographers, whilst it replaces entirely the Strutt of our fathers, or the costume books of the present day. The style of dress adopted by nations is so legitimately comprised within ethnographical study, and is even so intimately connected with local peculiarities, that the work of Mr. Doyle is undoubtedly within the limits of our criticism. In the British isles, for example, without referring to such broad race distinctions as prevail between the Celtic and Teutonic groups of costume, there exist such local forms of dress as the hat of the Welsh peasant woman, the loose silk kerchief of the factory girl, the flat bonnet and short jacket which the Cheviot peasant defiantly wears to distinguish himself from the Scotsman on the other side of the hill, the smock-frock of the majority of agricultural labourers, the diminutive and abbreviated representative of it which is confined to a small district in south-eastern Sussex, the Guernsey jacket, the "wide-awake" hat (truly the successor of the *pelotas* of Mercury), or many other articles of clothing which might be suggested.

All these form essential characters of the costume of England, as represented by its poorer classes, at the present day, and from this point of view may be advantageously contrasted with the dresses of the past population, as depicted in the beautiful chromo-lithographs before us. The whole subject is so intimately connected with art, commerce, and even with political partizanship, that it is difficult to consider it from a purely ethnographical basis.

For a most lucid idea of the costume of some of the aboriginal

* A Chronicle of England, B.C. 55—A.D. 1485; written and illustrated by Jas. E. Doyle. London: Longmans. 4to. 1864.

nations of Europe, we must refer to this work. We are so accustomed to form our conceptions of the "garb of old Gael" from mere outline sketches, destitute of the advantages of colour, that such a plate, for instance, which represents Caractacus in Rome attired in the scarlet and pink *braccae* or "trews" gives us a most lucid idea of the dress of this mythical representative of the Siluri. The change which has taken place in the colour of the costume of males in Europe during the last few hundred years is difficult to be accounted for on artistic grounds, though susceptible of easy explanation from the utilitarian point of view. The vivid colours which bedecked the courtier or the cavalier, the superabundance of ornament and decoration which characterised the fashions of the Tudor or the Caroline kings, have long since passed away, and the prevailing sombre tint of man's clothing in the nineteenth century, whilst it is far more convenient and economical, is far less picturesque.

The perusal of this work by anthropologists will originate many suggestive ideas as to the dress of the historical characters of England, and we doubt not that the second volume, which will treat of a subsequent period of English history, will be equally interesting.

ANTHROPOLOGICAL NOTES EXTRACTED FROM THE NEW YORK STATE DOCUMENTS.

By GEORGE E. ROBERTS, F.G.S., Hon. Sec. A.S.L.

It may easily be supposed that the persons officially connected with the state of New York during the earliest years of its colonisation did not pass over in complete silence the natural characteristics of the aboriginal people with whom they had dealings. And although the scientific leanings of these governors and their staffs of officials were certainly not specially directed in the interests of anthropological science, yet I have been rewarded somewhat for my trouble in wading through 7,000 quarto pages of "Public Records" by the discovery of more than one note having a significant bearing upon the races of Indians which, at the commencement of the white invasion, were lords of the North American continent. The notes I have met with I propose to give as simple extracts, adding a line or two of explanation where needed, feeling sure that to enshrine them in the *Anthropological Review* will be of interest to its readers, and possibly of use to the science.

I may first remark that these archives chiefly consist of the reports of the Dutch, English, and French governors of the various provinces to their respective governments; these have been collected, grouped, and published in ten (?) quarto volumes, under an act of the American legislature passed in 1839. I have only been able to examine eight of these volumes; but as the one (or two) to which I am unable to refer contains documents subsequent to 1770, I do not think that notes of anthropological value would be met with in them.

During the earlier years of the Dutch occupation of the state, from the first settlement on Manhattan Island in 1626 to about the year 1650, the study of the character of the red man was undertaken mainly to assist the padroons (colonists) in "taking and possessing" the land, and swindling the aboriginal man of all his rights thereto; the Incorporated West India Company agreeing to allot to each padroon "twelve black men and women out of the prizes in which negroes shall be found, for the advancement of the colonies of New Netherland." (MS. undated, File *West Indie*, 1630-35, Archives at the Hague.) Very naturally the Indians objected to being cheated, and a series of cruel conflicts took place, in one of which an act of barbarity was perpetrated by the colonists which even exceeds the tragedy of the caves of Deira. I note it, as it exemplifies the wonderful stoicism and contempt of pain possessed by the red man. A body of Indians, five hundred in number according to one account, seven hundred according to another, being hard pressed by the Dutch soldiers, retreated to their huts, and these being set on fire with a view of dislodging them, preferred to remain therein and be burnt rather than come out and be killed by their enemies. "What was most wonderful," says the States Document, describing this barbarous act, "is, that among this vast collection of men, women, and children, not one was heard to cry or to scream." No wonder that it passed for a common saying among the tribes, "even our devils will have nothing to do with the Dutch!"

The earliest description of the natives which I find occurs in a MS. preserved in the Royal Library at the Hague, written about 1641. "The Indians are of ordinary stature, strong, and broad-shouldered, olive colour, light and nimble of foot, subtle in disposition, of few words, which they previously well consider, hypocritical, treacherous, vindictive, brave, and pertinacious in self-defence, in time of need resolute to die. They have hardly any notion of God, no divine worship, no law, no justice; the strongest does what he pleases, and the young men are masters." I need scarcely remark that some parts of the above description have been proved incorrect by more friendly relationships; their ideas of justice we may admit as considerable,

without regarding the red man as that epitome of human virtue which Mr. Fenimore Cooper once would have us believe.

The States General of the United Provinces, in an Act dated 1661, make mention of the red man in a way which characteristically combines the acute trader with the propagandist—"great profit to be derived from traffique with the natives," reads this document, "who are naturally a mild people, very capable (and by the grace of God) to be drawne out of their blind ignorance to the saving light by Jesus Christ." But the governors of the British provinces held during the seventeenth century lived in far too brittle tenements to justify them in casting stones at the rule of their neighbours the Dutch or the French. Wars with the Indians were the rule rather than the exception during the history of their governance, and various were the reports and conjectures as to the causes of them. A very curious and lengthy report, by Edward Randolph, to the Council of Trade (A.D. 1676) gives some few of the opinions held. "Some impute it (the war) to an imprudent zeal in the magistrates of Boston to christianise those heathens before they were civilised;" and then the report proceeds to mention the puritanical decision of the government of Massachusetts, that the "barbarous heathen had commission of God to rise against them," by reason of the "great and provoking evils" of "men wearing long hair, and periwigs made of woman's hair; for women wearing borders of hair, and for cutting and laying out their hair, and disguising themselves by following strange fashions in their apparel; for profaneness in the people not frequenting the meetings, and others going away before the blessing is pronounced." (For this report, *in extenso*, see Hutchinson's Coll. Orig. Papers, Boston, 1769, p. 477.)

A curious journal is that of Mr. Wentworth Greenhalgh, who "made observations upon the Indians of western New York during a journey begun May 28th, 1677, and ended July 14th following," visiting the natives in their "stockaded towns," and taking divers notes of what he saw. What corn they have, and how many fighting men, appear to have been pet subjects with our old traveller, though he now and then notes social customs, *e. g.*—"Canagorah: here y^e Indians (Senecques, Seneca tribe) were very desirous to see us ride our horses, w^{ch} we did; they made feasts and dancing, and invited us y^t when all y^e maides were together both wee and our Indyans might choose such as lyked us to ly with." At another village of the Seneca Indians, Tiotehatton, an important one, by reason of the number and size of the "houses" (lodges), Mr. Greenhalgh saw fifty prisoners brought in from the south-west, the result of an engagement with a neighbouring tribe, and "this day," he writes, "were

burnt of them two women and a man, and a child killed with a stone; all night we heard a great noyse, as if y^e houses had all fallen, butt itt was only y^e inhabitants driving away y^e ghosts of y^e murthered." And next day, going to Canagarah (another Seneca camp), "wee overtook other prisoners, and when y^e soldiers saw us they stopped each his prisoner and made him sing, and cutt off their fingers, and slasht their bodys wth a knife, and when they had sung each man confessed how many men in his tyme hee had killed; that day at Canagarah there were most cruelly burned four men, four women, and one boy, the cruelty lasting about seven hours, and afterwards taking the hearts of such as were dead to feast upon."

(To be continued.)

ORGANIC PHILOSOPHY.*

A VERY diligent perusal of the above work has failed to imbue our mind so thoroughly with its precise object as to enable us to review it critically. The scheme of the volume is so vast, and so little defined in its objects and principles; and the methods of thought which the author follows are so little laid down, that it will be very difficult to criticise him from the standpoint of inductive science. Nor can we see the bearing on "man's true place in nature" of many of the "epicosmological" subjects on which Dr. Doherty treats. Discussions on the "geospheric" realm, on "geodynamic factors", on "cryptogamic unity", or the "isomeric forms of common minerals", no doubt have their value in a treatise on "Organic Philosophy"; we scarcely, however, regret that the objects of our review preclude the consideration of these topics with Dr. Doherty.

Although our author protests against the materialism of Comte, and against most theological systems, excepting his own peculiar faith, which occasionally verges on the incomprehensible, the application of the transcendental method he adopts to modern zoology and anthropology leads to some very curious results. We can scarcely, however, use the term "transcendental" to adequately designate Dr. Doherty's conclusions; his "*vernunft*" is wholly distinct from that of Schelling or of Oken.

Let us follow him throughout the mammalian series, in the hopes of being guided by the light of "epicosmology" to man's true place

* Organic Philosophy; or Man's true Place in Nature. Vol. i: Epicosmology. By Hugh Doherty, M.D. London: Trübner and Co., Paternoster Row.

in nature. We are met with a remarkable classification, which we must abridge from the 166th and 167th pages of his work:—

- VII. Simial order (comprising bats and monkeys!)
 - 7. Lemural order.
 - VI. Canine order.
 - 6. Feline order.
 - V. Ursine order.
 - 5. Marsupial order.
- IV. Anthropine order
 - Mediumistic (!) races.
 - Temperate clime races.
 - Subtropical races.
 - Tropical races.
 - III. Equine order.
 - 2. Hornless order of
 - Ruminants
 - In which the musk and chevreotain are placed in distinct families!
 - II. Horned order of Ruminants.
 - 1. Rodent order.
 - I. Pachydermal order (including cetacea and sirenia!)

Dr. Doherty, after penning the above, kindly remarks, "Professional naturalists may possibly not admit our views of method and arrangement. We do not admit theirs." We are glad to perceive that Dr. Doherty has no intention to employ the weapons of persecution against the ill-fated "professional naturalists"—poor working men who are content to labour in the search of facts, and to leave "epicosmology" to be expounded by the "reasoner". But we venture, as anthropologists, to offer one feeble petition to our author not to classify mankind between the kangaroo and the horse. The relations of man to the ape may be denied successfully by Dr. Doherty; but we fear that his too close proximity to the opossum and the Shetland pony would be equally as offensive to man's moral nature. Still less are the European races to be conciliated by the pretty epithet "mediumistic" applied to them; although we can assure our readers that it bears no reference whatever to M. de Quatrefages' papers *Sur l'influence des Milieux*, nor to any previous literature we have read.

Turning to Dr. Doherty's anatomy, we are gravely told that "the mouth, pharynx, and œsophagus inosculate with the stomach; the duodenum links the stomach with the small intestines; the anus and the rectum inosculate with the large bowel; and the chief digestive gland ducts inosculate with the mouth and the duodenum." The marvellous *agapemone* which man's viscera seems thus to be is slightly past our precise comprehension. No bowels of mercy are however shewn by him to the unfortunate "taxionmist" (*sic*), because he states, "Nor does it matter, as a point of natural distinction in each case, whether analogies or correspondency of any kind be evident or not."

It is undoubtedly evident by the above that the author is governed by other principles than those which actuate the majority of anthropologists. We extract our author's definition of his anthropine alliance.

"This contains but one order, that of man; and this order contains but one family. There are several varieties of the animal or physical man, and that is all we have to consider in arranging the different alliances of the mammalian class. Man as an animal is one thing, man as a human being is another. There are but few races of the bimanal series that have yet been somewhat developed as rational and social beings. As a vertebrate animal, man is distinguished by a very slight diversity of form compared with that of the anthropoid ape, the dog, the bear, or the pig; but as a moral being he is quite distinct, whenever he attains to the dignity of that estate. It is not, however, as a human being we have now to deal with the bimanal type, but as an order of peculiar structure in the mammalian class. We have had elsewhere to deal with man as the head of the creation.

"In organic parallels of structure man claims the highest place in the development of brain and nerves. The natural divisions of the nervous system, therefore, should be those of the human races in a purely physical point of view. The nervous system may be variously subdivided, according to the regional distribution or the functional uses of the different parts. In form and function nerves resemble telegraphic wires, communicating some kind of radiatory influence from the body to the mind, and from the mind to every part of the body; and hence they have been classed as sensor and motor nerves. This gives us only two distinctions.

"Conductor nerves, sensor and motor, are composed of a soft, white substance terminating in the cerebrospinal centres, and in the peripheral or ganglionic extremities, amidst a gelatinous vesicular grey substance which seems to be the articular or connecting medium between the physical substance of the body and the supersensuous forces of the soul. The distinction of nervous matter, then, into white and grey substances, gives us another twofold distinction. It seems to be as difficult to find complexity of form and structure in the nervous system as in the races of mankind. In either case the whole system or alliance would appear to consist of one order only or one series; and yet the nerves communicate with every part of the body, influencing it in a peculiar manner, according to the difference of function in each tissue and organ. The races of mankind are also very much diversified in minor points of form and feature, though very faintly marked in varieties of organic structure. Differences of colour and complexion are numerous but insignificant, and other diversities of race are hardly more important."

The new feature of Dr. Doherty's work may, however, be chiefly indicated as the introduction of the novel, elegant, and classical epithet "realmological" as applied to classification; and the copious use of such terms as "altero-pluvial," and similar words. Our author's classical knowledge is thus indicated.

"It would be difficult, however, to form perfectly appropriate names for any one family or series, exceptions being numerous in every group of common forms and features; and even where anomalous forms are fewer in proportion, the names would be a difficulty. Greek or Latin words alone, simple or compound, would be unfamiliar [to whom?]. Greek and Latin hybrid compounds would be more or less objectionable."

Apparently, however, he has no objection to the frequent employment of hybrid compounds which are neither Greek nor Latin, but also include a judicious mixture of the "vulgar tongue."

If man may plead with Dr. Doherty against his intercalation between horse and kangaroo, the poor pigs have still less reason to be pleased. We are gravely told, *ex cathedra*, "elephants are quite distinct from tapirs, and these again from trunkless swine, such as the pig, the hippopotamus, and the rhinoceros." Having failed to appreciate the sense in which the rhinoceros can be said to be a "trunkless swine," we cannot here participate in the indulgence which, on his 145th page, he accords to scientific men. He deems the quadripartite arrangement of lemuridæ "legitimate and natural; and here, again, we agree with men of eminence in this particular branch of science." A desire not to participate in the marvellous and unaccustomed sensations of those "men of eminence" who may accord in Dr. Doherty's opinions induces us to congratulate him most cordially on the new and appropriate version of the nursery rhyme he has not thought it beneath him to pen on his 100th page:—

"Industrial work I love to shirk,
"Art-work is just as bad,
"The moral law doth puzzle me,
"And science drives me mad."

It is very lamentable to see the paths of natural scientific study thus departed from. It is grievous to be amongst the pioneers of a science which as yet is visited with the crop of self-called "reasoners," each proceeding along his own method of deductive argument, and the labours of each resulting in a blurred mind-picture of the true objects of science. The true scientific success of a nation will never be advanced by such misuse of those faculties for which man is responsible; and, even indirectly, will never be assisted by the puny endeavours of the transcendentalist.

C. C. B.

PROCEEDINGS OF THE ANTHROPOLOGICAL SOCIETY
OF PARIS.*

IN the concluding number of the fourth volume of the Paris society's *Transactions*, we have an extremely interesting analysis, by Dr. D. Lubach of Haarlem, of his work upon the inhabitants of the Netherlands, or at least upon that part of it which relates to their anthropology. Dr. Lubach considers that, before the arrival of the Germanic races, the primitive inhabitants of the Netherlands belonged to the race by which Germany itself was originally peopled. He says that the primitive stone monuments known here under the name of *Hünedden* are precisely similar to the *Hünedetter* and *Riesengräber* of the north-west of Germany, and to the *Jettegrævar* and *Steenhamner* of Scandinavia; and that the arms and other stone objects found in all these are similar. But whereas, with these objects, in Germany have been found skulls belonging to this primitive population, and entirely differing in form from the German type, in the Netherlands it appears that the objects of art alone have been preserved; whilst, unfortunately for anthropological science, any human remains that may have been discovered have been cast aside as worthless, and irrecoverably lost.

Notwithstanding this want of data, Dr. Lubach affirms that the aboriginal inhabitants of the Netherlands are brachycephalic, short or of middle height, and probably with black hair and eyes, resembling more or less the primitive people of Scandinavia, and forming an intermediate race between these and the Gauls. To this original race succeeded immediately the Germanic races. In the time of the Romans, a chain of Germanic peoples extended along the shores of the North Sea. Of all these peoples, except the Menapii of Zealand and Flanders, the Frisons were the only ones who dwelt in the Netherlands. If we consider the Menapii as belonging to the same group as the Frisons, then the chain of Cimbro-Menapian tribes was interrupted, between the Rhine and the Saal, by two Germanic peoples, which had come, during the historic period, from the heart of Germany. These were the *Batavi* and *Caninefates*, tribes which had originated in Hesse. Then the *Chamavi*, the *Salii*, the *Tubantes*, the *Toxandri* went to complete the population at the time of the Roman domination. The Franks and *Salii* made their appearance probably about the middle of the fourth century, and the Saxon towards the end. In the time of the emperor Julian, the Batavians,

* *Bulletins de la Société d'Anthropologie de Paris*, vol. iv, 4eme Fascicule, Sept. to Dec., 1863; vol. v, 1er Fascicule, Jan. to March, 1864.

whose name only remains as the name of their island, formed a portion of the Frank confederacy. From Batavia and the north of Belgium the Salian Franks gradually extended their dominion towards the south. At last, their king, Hlodwig (Clovis), having become chief of all the Frank tribes, conquered a great part of the Gauls, and established the Merovingian dynasty.

The Frisons took a considerable part in the invasion of Great Britain by the Saxons towards the end of the fifth century. Several English ethnologists believe that the county of Kent was principally peopled by the Frisons. During the struggle between the Frank and Saxon kings, which commenced in the sixth century and lasted more than three hundred years, the Frisons formed a portion of the Saxon league. After their conversion, by the English missionaries, to Christianity, however, being subjected to persecution by their pagan kings or chiefs, they became dissatisfied with their government; and in 775 they agreed to be incorporated in the Frank empire. The important ethnological division of the Netherlands into Frisons, Saxons, and Franks dates from this time. After tracing at considerable length the various modifications, re-divisions, and changes of locality of these peoples, and describing their peculiar characteristics, Dr. Lubach proceeds to describe the characters of the skulls of the different races. The Frison skull presents, according to his description, a strongly-marked dolichocephalic form, a high forehead, the occiput very prominent by the development of the tuber occipitalis externus, as is also seen in the majority of Scandinavian skulls; vertex cranii depressed and slightly arched; facial angle rather large; nasal bones ordinarily large and prominent; lower jaw generally high; chin much produced, but rather retrocedent. The characters of the undoubtedly non-Frisic skulls which he had seen are the following: antero-posterior diameter shorter; transverse diameter, or the contrary, longer than in the Frisons; zygomatic arch larger and more arcuated;inion slightly or not at all prominent; the curved line between the root of the nasal bones and the foramen magnum, which he terms the cranial arch, more highly vaulted than in the Frisian skulls. All the head has a more globular, and often a more squared form. The facial angle of these skulls does not differ from those of the Frisians; but the face is shorter and broader, which is partly at least due to the less height of the lower jaw and the greater prominence of the zygomatic bones.

The next paper, upon the Mincopies, or inhabitants of the Andaman Islands, by M. Broca, is to a certain extent a *résumé* of Professor Owen's paper, read before the British Association in 1861, and with which our readers are doubtless already familiar. M. Broca adds, however, some most valuable critical observations.

It appears that the Société d'Anthropologie de Paris resolved, some time ago, to publish a coloured plate shewing the principal types of colour of the human hair, skin, and eyes, arranged in a systematic gradation of shades and accompanied by numbers referring to and explaining the different tints. Upon the completion of the third portion of this work, viz., that shewing the different tints of the eye, M. Broca read a very interesting paper, shewing how the information he has supplied has been arrived at.

The first difficulty which M. Broca had to contend with, was the rendering, by a single tint, the variety of shades to be found in different portions of the iris. The shade required was the *medium* shade, or mean quantity of colouring matter to be found distributed in the various shades of the iris. This was only to be obtained by placing the eye at such a distance that all the partial tints became confounded or united in a single colour. The delicacy required in this operation may be readily imagined. The most embarrassing point, says M. Broca, was the choice of the types of which the table should be composed. There is a certain number of colours which are very frequently met with; others are more rare, but must still necessarily be represented; there are even rare shades which are most difficult to characterise by description, and which it is consequently more important to place before the eyes of travellers as points of comparison. M. Broca commenced by reproducing, after nature, the most common colours, and found that they could be arranged in a small number of natural groups, each of which included all the fundamentally similar colours, or darker or lighter tints of the same colours. The colours were arranged upon the principle of M. Chevreul (who shewed that every colour leads from black to white by imperceptible gradations), each commencing with the deepest and leading down to the lightest shade. The first table composed consisted of three series, each consisting of four or five shades. In order to elaborate this, M. Broca availed himself of the assistance of Dr. Siebel and of M. Boissonneau *fils*, the first of whom supplied him with a number of paintings in water-colours of various coloured eyes, which enabled him to make what would appear to be a complete table of the different colours of eyes to be found amongst the population of Paris. The information obtained from M. Boissonneau was, if not more valuable, at all events much more varied. That gentleman has carried the art of manufacturing artificial eyes to the greatest possible perfection, and has consequently obtained for himself a *clientelle* in all parts of the world. As each artificial eye has to be made either from minute inspection or from an accurate painting of the natural one with which it is to correspond, and as M. Boissonneau always causes duplicate specimens of

all that he makes to be preserved, it may be inferred that his collection was of the utmost use to M. Broca in assisting him in the completion of his series, containing, as we are informed it does, eyes of Chinese, Negroes, Hindoos, Peruvians, Arabs, Egyptians, and inhabitants of all parts of Europe, all of which were freely placed at M. Broca's disposal.

(To be continued.)

THE FOSSIL MAN OF ABBEVILLE AGAIN.

WE have received a copy of *L'Abbevillois*, of the 19th July, which calls attention to the following facts, which are likely again to revive the much debated question relating to the Moulin-Quignon and Mesnières remains.

The neglected condition of a quarry, in which work was interrupted from the end of 1863 until May 1864, permitted M. Boucher de Perthes to pursue his researches without the intervention of any person. The workmen did not participate in these new discoveries; everything was seen in place, and taken from the bed by his own hand.

For a long while it had been remarked that osseous remains had been ordinarily enclosed in sandy agglomerations, which thereby often escaped observation by the geologists and by the excavators themselves. They noticed that the bones were incapable of recognition, and termed them *cailloux pourris*. The anatomists to whom they were shewn admitted that they were actually organic remains, but found they were too much broken or deteriorated to ascertain their exact nature.

Things were in this position since the discovery of the jaw. This confirmed M. de Perthes in his opinion that these neglected remains had more importance than was considered, and that there also were some human remains amongst them. With the perseverance by which he is known, he continued to explore the bed of Moulin-Quignon, making more than forty excavations from June 1863 to the present time.

Numerous fragments of human and animal bones discovered by him at two, three, and four metres from the surface, in undisturbed soil, and where there existed neither *éboulement*, nor fissure, nor even a sandpipe, were the recompense of this long labour. But, as it was not sufficient that these remains should be discovered by himself alone, it was necessary, in order to obviate contradiction,

that others should discover them with him. The 24th of last April he asked M. Jules Dubois, doctor, of the Hôtel Dieu at Abbeville, to assist at one of these diggings. M. Dubois hastened to accept this invitation.

Many fragments of rolled bone too small for definition, were then disinterred at two metres from the surface, in the yellow-brown bed. At sixty centimetres lower, M. Dubois saw in place a bone eight centimetres in length, which, disembarassed from the matrix, was recognised by him as a human *os sacrum*.

The excavation was then directed to the other end of the quarry, where a bed of yellowish-grey sand, called *sable d gre*, is shewn dividing the brown bed, a bed so hard, that here the hand is no longer sufficient, and the pickaxe must be employed. A human tooth, partly embedded in its sandy matrix, was by them seen in place and extracted from the bed by M. de Perthes, with all the silex which was fixed to it.

On the 1st May another excavation was made by M. de Perthes and M. Dubois. The ferruginous bed on the right hand afforded them, at a depth of 2 metres 25 centimetres of depth, three very damaged fragments of skull, but probably human. The grey bed on the left hand gave them some other bones, not yet determined, and a fragment of human tooth.

On the 12th May, M. Hersent Duval, owner of the quarry, and well known to geologists for the entirely disinterested courtesy which he affords to explorers on his land, being on the spot, desired to assist in the excavation, and he himself also was able to see in place at 2 metres 30 centimetres of depth, and to extract with his hand, a fragment of human skull.

On the 17th, M. Martin, *curé* of St. Gilles, formerly professor of rhetoric and of geology at the seminary of St. Riquier, and of whom no person here will deny the great knowledge, and M. l'Abbé Dergny, member of the Société d'Émulation, united with M. de Perthes to carry on an excavation. It was crowned with entire success. After being assured of the normal state of the soil, and of its being undisturbed, and having examined various fragments which were detached from the bed before their arrival, they saw in place and dug out, without the intervention of workmen, a bone which, disembarassed from the matrix, was discovered to be a human skull, of which the strange depression of the superior part struck them exceedingly. The edge of this skull, worn by rubbing, demonstrated its antiquity, and these gentlemen did not doubt that it was coeval with the origin of the bed.

Monday, July 9th, a commission, composed of MM. Sauvage, adjunct to the mayor of Abbeville, L. Trancart, proprietor and mayor of

Laviers, Auguste de Caën, *avocat*, Marcotte, librarian and curator of the museum, Jules Dubois, already named, all members of the Society of Emulation, made an excavation, of which the results were equally conclusive. Many fragments of human bone were seen *in situ* and obtained by them from the deposit.

A more formal verification was accordingly contemplated. On the 16th July, the same commission again met, adding to it M. Buteux, formerly member of the General Council of the Somme, who is about to be decorated with the legion of honour for his valuable geological labours, M. de Mercey, a well known geologist, who came expressly from Paris, M. le Baron de Varicourt, chamberlain of the king of Bavaria, who came from Amiens, M. Girot, professor of physics and of geology at the college of Abbeville, M. de Villepoix, member of the Société d'Emulation, M. Alexandre Catel, M. Oswald Dimpre, and many other persons who united spontaneously with the commission, and of whom we regret that the names are unknown to us.

By this reunion of men, all friends of science and of truth, an excavation was made, and carried down to the chalk; many human bones, one of which was found actually on the chalk, were seen in place and collected by the commission. All these bones, amongst which the remains of animals are found, will be the object of a special study which Dr. Dubois has undertaken at the wish of the commission.

M. Boucher de Perthes, in the pursuit of his anthropological discoveries at Moulin-Quignon, has made one which geologists will not the less appreciate; these are marine shells exceedingly rolled, and for the most part reduced to the state of small white pebbles, very much resembling those of the flints, with which they might be confounded. He discovered them in the brown and grey beds, at 1 metre 50 centimetres to 3 metres from the surface, and mixed with the bones. He thinks that in the careful study of the other beds of the diluvium, and especially those where chipped flints have been discovered, human remains should also be found, otherwise so difficult to be distinguished from the rough flints of which they have taken the colour and nearly the form by the portions of sand, gravel, and small pebbles which attach to their anfractuosités, and of which they form a part.

P.S. We learn that amongst the bones collected by M. de Perthes are found two fragments of an upper jaw, and one almost entire lower jaw, also human, and which, it is said, resembles in form much that of the 28th March, 1863; it was 4 metres 30 centimetres of depth, and 22 metres from the spot where this last was discovered.

[We abstain at present from offering any comment on the above.
EDITOR.]

Miscellanea Anthropologica.

Prize Anthropological Memoir. The Paris Anthropological Society's triennial prize of five hundred francs, founded by Ernest Godard, will be awarded in May 1865. The prize will be adjudged for the best original memoir on a subject connected with anthropology. Manuscripts sent in for competition may be written either in French, English, or Latin, and printed memoirs in either of these languages, or German, Italian, Portuguese, or Spanish. The essays must be sent in before January 5th next year, addressed to the society's secretary, No. 3 Rue de l'Abbaye, Paris.

The Neanderthal Skull. [Extract from a letter received by Mr. C. Carter Blake from Dr. Pruner Bey.] "Regarding the Neanderthal man, it is indeed possible that the rachitism discovered by M. Meyer may have had its influence on the development of the frontal sinuses. The interior cast is remarkable for the right ascension of the frontal lobes of the brain, so that the expansion of the above-mentioned cavities has not at least influenced the human characters of man. There is besides this to be observed on the upper surface of the same lobes what you might call an "affaissement" of the gyri, which you attribute to the age of the individual, because you see the same on the cast of the illustrious Dr. Gall's skull, in my possession. For all the rest, chiefly as regards proportions, this interior cast corresponds nearest, as you observed, to that of a modern Irishman. Only in the last, which belonged to a younger individual, the gyri are more turgescient and the vertex is a little more elevated. Since I had the honour to write you my last, Providence has favoured me with the acquisition of a specimen which completes the proofs of the Celtic origin of the Neanderthal man. It is the frontal bone of a very ancient Celt, obtained from a tumulus in France, and belongs to a very young individual. Still, the frontal sinuses lying open, shew on the exterior and in the interior such a development, that this specimen, with its depressed forehead, may form a link, with others in my possession, to shew the progressive and regressive state of this particularity in ancient Celtic skulls. That this specimen, too, belongs to a highly dolichocephalous person, is evident on the first inspection.

"Yours, most respectfully and truly,

"PRUNER BEY."

9th July, 1864.

Recent Discoveries of Kjökkenmöddings.—The following letters have recently appeared in the pages of a contemporary:—

"Halifax, Nova Scotia, June 21.

"During the last winter session of the Nova Scotian Institute of Natural Science, the Rev. J. Ambrose, rector of the parish of St. Margaret's Bay, a district lying on the Atlantic seaboard of this colony, brought to the notice of the Institute the existence of extensive beds of refuse

shells and bones, mixed with fragments of rude pottery, and perfect and imperfect flint arrow and spear heads. Gifted with an inquiring mind, the gentleman in question naturally considered that their occurrence was not a matter of chance; and, following up the subject, he ascertained that similar beds had been known to exist on the shores of Denmark and the adjacent isles, and that they had received the name of *kjökkenmöddings*, or kitchen-middings, from being heaps of refuse shells, bones, etc., thrown aside by the primitive races of men who, in days of remote antiquity, visited annually, or dwelt continuously, in such positions. On perusing an article published in the *Report* of the Smithsonian Institute for 1860, which gave an interesting account of the kitchen-middings of Europe as surveyed by the Danish archaeologists, a perfect resemblance to those of the Nova Scotian coast was at once perceived, in so far at least as the few specimens then obtained from these heaps proved.

"To endeavour to make a thorough search, and prove the nature of these deposits, the Council of the Institute of Natural Science decided upon having a field meeting on the spot where the kitchen-middings lay; and accordingly, on the 11th of June last, a large party proceeded by land from Halifax, the capital of the province, to St. Margaret's Bay, which is distant, in a S.S.W. direction, about twenty-two miles. This bay is exceedingly spacious, runs inland some eight or ten miles, and is in breadth, perhaps, five or six miles. A few islands stand at the entrance as well as at its head, and long low promontories, clothed with spruce, birch, and maple, stretch into the water at the N.E. corner, forming snug coves and sheltered strands. It is on the shore of one of these minor bays, having a sandy beach where canoes could be hauled up easily and safely, that the principal *kjökkenmödding*, found by Mr. Ambrose, lay, on a rising knoll some 20 feet above the level of the bay at high-water mark. It forms part of a grass field belonging to a farm-house hard by; and according to the statement of the farmer, and the appearance it presents, has been submitted to little, if any, disturbance at the hand of man. The deposit appears to have extended about fifty yards or more in length, by a well defined breadth of eight yards. Its surface is irregularly depressed and dotted over, on its western extremity, with granitic boulders of no great size. The soil which covers the mass is similar to that of the field in which it occurs, though, perhaps, a little darker in colour. It grows common meadow-grass and ordinary field plants, and its depth does not exceed two or three inches when the shell deposit appears, presenting a layer of compact shells, perfect and imperfect, in which lie bones of animals and birds, flint and quartz arrow and spear heads, large and small teeth, and broken pieces of very roughly-made pottery, bearing evident traces of attempt at ornament. This pottery was very dark in colour, and contained in its substance grains of granitic sand and mica in quantity. From the pieces of rim obtained, judging from their curvature, the earthen vessels could scarcely have exceeded the dimensions of a quart bowl. These bowls or cups must have been in common use, as the fragments occur in some plenty. No traces of implements denoting any connexion with the

later iron age occurred; and the only objects on which the art of man had been practised beyond the pottery and flint weapon heads, were bones sharpened into awls, one of which was obtained in a very perfect state.

"In the midst of, but more abundantly at the bottom of the refuse deposit, occurred rounded stones, from the size of a man's clenched hand upwards, bearing evident traces of having undergone the action of fire. These stones are precisely similar to those found on the beach beneath.

"At the bottom of the refuse heap, which occurred at a distance of eighteen inches from the surface, a layer of black soil came, two inches thick; then a layer of white-brown sand of the same thickness; then came a reddish-coloured earth, getting lighter as the spade went down, until the original foundation of hardened drift proclaimed no further investigation necessary in that direction. Taking a general view of the surface, the observer naturally supposed that the rounded granite boulders which lie scattered on the heap had afforded seats for a primitive people, who rudely cooked their food at this encampment on the edge of the wild forest; nor was the supposition incorrect; for, on digging around these boulders, greater masses of shells, and more evident traces of fire, were apparent than in other parts of the heap. The charcoal, in some instances, had lost but little of its former consistency, while, in others, it powdered into dust on being handled. This probably arose from the nature of the wood, some kinds affording a hard charcoal, and others soft.

The fauna of this Nova Scotian *kjökkenmödding*, so far as could be ascertained, was as follows. Of mammals, the moose (*Cervus alces*), the bear (*Ursus Americanus*), the beaver (*Castor Canadensis*), and the porcupine (*Hystrix dorsata*), were noticed; the beaver and porcupine by their teeth, which, from their brightness and compactness, might just have been taken from the jaw. A beaver's tooth had the root part rubbed, and smoothed to a head, giving, with its chisel-like point, the appearance of an instrument for cutting. Some of these teeth were jagged on their edges, as if by artificial means. The bones of the animals had been broken, and, with the exception of a few very small ones, none were obtained whole. Of birds, there were the bones of different species, some very large, and evidently belonging to a bird much larger than the great northern diver (*Colymbus glacialis*), which is one of the largest wild birds in the colony at the present day. The bird bones were also more or less broken, and one in particular had been opened by means of a cutting instrument down the side. Of fishes, the vertebrae of two or three species, the largest measuring about an inch in diameter; while two or three specimens of the opercular spines of the Norway haddock (*Sebastes Norvegicus*) were procured among the *débris* in a perfect state, which led to the supposition that they were used for some purpose, such as pricking holes. Of mollusks, the most common were the quahog (*Venus mercenaria*), clam (*Mya arenaria*), scallop (*Pecten Islandicus*), *Crepidula fornicata*, and *Mytilus edulis*. Of the two former species nearly the whole mass of shell consisted. The mussel shells had become so friable that the slightest touch was sufficient to break them.

"Time did not permit, however, a closer examination to be made on this first visit to the mounds; but some members of the Institute, aware of the interest attaching to the subject, have decided upon camping out during the ensuing summer in the vicinity of other deposits known to exist in various places, and hope, by thoroughly excavating the several mounds, to bring to light specimens which will doubtless help to prove the age in which they were constructed, and the similarity which existed between the manners and customs of the race who formed them and the constructors of those placed in like positions on the shores of Denmark and Northern Europe.

"J. M. JONES, President of the Institute of Natural Science."

186A, Piccadilly, July 11, 1864.

"The general description of Mr. Jones in your last number of the *Shell-Mounds* in the Halifax district corresponds with one on a much larger scale that I have identified at Smyrna. This is known to residents and the old travellers as the fossil oyster-beds, but later travellers and geologists have ascertained that the oyster-shells are of late period.

"They form a bed on the side of Mount Pagus, below the Acropolis and above the theatre, constituting a stratum extending for above half a mile. Just above the theatre the deposit is cut through by a road leading to a quarry, and is there, I should say from memory, about sixteen feet deep. The deposit, like that near Halifax, is covered with soil and *débris*, and is also composed of a layer of *compact shells, perfect and imperfect, in which lie bones of animals and birds and broken pieces of pottery*. I found what appeared to me flint implements, but I have not yet had time to make a satisfactory examination. The pottery is not like that at Halifax, but is red, and like the common pottery of the country. I have invited the attention of the members of the Academy of Anatolia to this deposit, as belonging to a city of the Iberian or pre-Iberian epoch. Various hypotheses have been put forward to account for the oyster-shells and pottery, but there has been an unwillingness to refer them to a remote date, the general opinion being in accordance with the fable that ancient Smyrna was not on the present site, and that the inhabitants dispersed in villages on the plain of Boornabat were concentrated at Smyrna by Alexander the Great, whose followers began the Acropolis. To my mind, and I have been confirmed by several archæologists, the corner of the Acropolis next the city shews decided traces of so-called Pelasgian work. Thus, according to my view, the Acropolis was the Iberian or pre-Hellenic city, and the deposit on the hill the site of a still more ancient city. My impressions have been confirmed by comparison with the new collections in the British Museum.

"HYDE CLARKE."

[We understand that the Anthropological Society of London are making inquiries at Smyrna, with a view to elicit further information on this most interesting subject. EDITOR.]

Description of the Cavern of Bruniquel, and of its Organic Contents. Part I. Human Remains. By Professor RICHARD OWEN, F.R.S., &c. (Abstract of paper read before Royal Society of London, June 1864.)

In this communication the author gives an account of the Cavern of Bruniquel, Department of the Tarn and Garonne, France, in the state which it presented when visited by him in January 1864, and a description of the human remains discovered therein by the proprietor, the Vicomte de Lastic St. Jal, in 1863, and subsequently by the author in January 1864. The circumstances under which these discoveries were made are minutely detailed, and the contemporaneity of the human remains with those of the extinct and other animals with which they are associated, together with the flint and bone implements, is shown by the evidences of the plastic condition of the calcified mud of the breccia at the time of interment, by the chemical constitution of the human bones, corresponding with that of the other animal remains, and by the similarity of their position and relations in the surrounding breccia. Among the principal remains of the men of the flint-period described are the following:—1st, the hinder portion of the cranium, with several other parts of the same skeleton, which were so situated in their matrix as to indicate that the body had been interred in a crouching posture, and that, after decomposition and dissolution of the soft parts, the skeleton had yielded to the superincumbent weight; 2nd, an almost entire calvarium, which is described and compared with different types of the human skull, shown to be superior in form and capacity to the Australian type, and more closely to correspond with the Celtic type, though proportionally shorter than the modern Celtic, and the form exhibited by the Celtic cranium from Engis, Switzerland; 3rd, jaws and teeth of individuals of different ages. After noticing other smaller portions of human cranium, the author proceeds to describe minutely the lower jaw and teeth of an adult, and upper and lower jaws of immature individuals, showing the characters of certain deciduous teeth. The proportions of the molars are not those of the Australian, but of other races, and especially those of ancient and modern Europeans. As in most primitive or early races in which mastication was little helped by arts of cookery or by various and refined kinds of food, the crowns of the molars, especially of *m* 1, are worn down beyond the enamel, flat and smooth to the stumps, exposing there a central tract of osteodentine without any sign of decay. The paper is illustrated by a view and plans of the cavern, and by figures of the principal human remains, and of two implements of bone on which the Vicomte de Lastic had discovered, on removal of the breccia, outline figures of the head of a reindeer, and the head of a horse in profile. The description of the various remains of the animals killed for food, and of the flint- and bone-implements applied to that and other purposes, will be the subject of a future communication.

Proportion of Female to Male Steps. By Dr. FECHNER. The proportion was found by Dr. Fechner to be = 100,00 : 115.76. To determine this proportion, Dr. Fechner observed from his window how many steps the by-passers, male and female, took to go over a certain distance (some twenty odd steps); 1258 females made on the whole 31,142.54 steps; males 1796, 38,409.05 steps. The observations were made on week- and Sundays at different times of the day

and variable weather, all which influences the steps. Excluded were children, cripples, or persons carrying bundles. The house in which the observations were made is situated in one of the suburbs of Leipzig, where working people and peasants pass in and out, and also citizens. According to Quetelet, an adult man is on the average 1.684 meter high, a woman 1.579 meter; hence a woman is about one-sixteenth less in length than man; it follows that the length of the step differs more than length of body, for the step of the woman is, according to what is stated between one-seventh and one-eighth less than that of man. This may be explained by the fact that, the extremities are, in proportion to length, less in woman than in man.

Names of Negroes. Kiessler writes from the African coast. "The naming of children among the Negroes is peculiar, depending on the day the children are born, whether it be the first or second, and whether it be from the same mother. A boy born on Monday receives the name of Kodjo, a girl Adjuwa; a Tuesday boy Kobena, girl Abenaba; Wednesday boy Kwaku, girl Effna; Thursday boy Kwauw, girl Aba; Friday boy Koffi, girl Effna; Saturday boy Kwamena, girl Amba; Sunday boy Kwassi, girl Akuffna. The first and second child have, among the Elminese, no other particular name, but the third boy is called Maisang, the third girl Mansang; fourth son Anan, fourth girl Emanan; the fifth, sixth, and seventh have no particular names, but the eighth, whether boy or girl, is called Aodju; the ninth Acon; the tenth son Baddu, tenth daughter Baddua; the eleventh child Dukung, and the thirteenth Duansa. Twins are called Atta; the first-born Atta-Panim, the second Attakakra (Kakra means little). Triplets are called Ahinanhang. A Negro may thus have three names or only one. *Ausland*, 1852, p. 1007.

The primary stocks seem to have been originally formed both for and by the localities they inhabit.—In one primary stock, the Caucasian, the cerebrum, or large brain, predominates; hence the developed forehead, the expressive features, and the noble carriage. Eyes variously coloured, teeth perpendicular, nose large, mouth small, chest broad. The skin, not being much oxidised, is whitish.

Negro.—The cerebellum is predominating; hence the receding forehead, oblique teeth, etc. The skin is perfectly oxidised, therefore black and velvety. Both religious and political life is there in its infancy.

Mongol: the intermediate stock.—As the middle brain predominates, the head appears large, angular, the forehead low, cheekbones prominent, nose flat, lips thick. The skin varies, approaching either the Hindoos or the black. The American, Mongol, and Malay races of Blumenbach form this intermediate stock. (*Lindemann, Anthropology*.)

Origin and Mental Agents.—The greater the mental development of a stock, the larger the sinciput and the frontal bone, the jaw recedes, the teeth are perpendicular, the facial angle larger, and the cranial capacity, in proportion to the face, larger, the latter becoming more

oval. Facial angle in the Caucasian 80-90°, Mongol 75-80°, Negro 70-75°. Link and Ith assume that the negro sprang from the ape, and that negroes formed the original human stock, as nature progresses from the imperfect to the perfect. This idea must be rejected, as the most savage nations stand far above the ape. Oken, Treviranus, Burdach, Goldfuss, and others, have justly observed, that we must not merely ascend from the animal up to man, but descend from man to animals. (*H. Lindemann, Anthropology.*)

Diversities of Mankind.—The diversity of the original stocks seems to have been conditioned by the various climates. All men, no matter whether they descend from one or several pairs, form but one species, which, however, is subdivided in primary stocks, influenced by climate, civilisation, habits, and morals. Fundamentally, all men are like each other in one respect, as they all manifest the same mental phenomena; they all more or less have religious notions, and may by intermixture produce fertile children. (*Extracts from Vorlesungen über Anthropologie.—Lectures on Anthropology, by Dr. H. Lindemann, Prof. at Munich. Erlangen, 1848.*)

The Folds in the Hand as indicating Race (Instructions by Serres to Deville the traveller; also in Comptes Rendus).—The more we study the human organism, the more do we discover facts apparently insignificant, which are yet of value in determining races. The folds in the hand, so much celebrated in chiromancy, are of this kind. I have elsewhere indicated the relation between these folds, and the articulations of the fingers; but there is one fold which is not constant in all races, it is that which from the base of the ball reaches the summit of the fold, formed by the articulations of the first phalanges of the last three fingers. I have called this fold the Caucasian line, as it exists in all varieties of this race. It is but little perceptible in the Mongol race, and is completely absent in the Ethiopian, and seems equally absent in the types seemingly derived from that race. This, at least, results from a very curious observation made by M. D'Abbadie in some thousands of hands seen by him among the Abyssinians, the Caucasian fold is generally wanting. If the South Americans descend from the Polynesians, the absence or presence of this line would furnish an important indication. Among the North Americans which we have seen in Paris, as well among the Chinese, the Caucasian line is feebly indicated. (*Centralblatt: Miscellaneous Notices.*)

Psychical Difference between Man and Brute.—It is personality and free will by which man is specifically distinguished from the brute. However clever, cunning, or docile an animal may be, we never look at it as a person; for neither theoretically nor practically does the animal, in all its sensations, arrive at a consciousness of its own nature. It is just because man is enabled to do so, bearing within himself from his birth this germ, that the whole mental life of man is, through all the stages of its development, so radically different from the mental life of the brute. The distinction between man and brute becomes more striking when we exhibit the contrast

between the instinctive performances of animals, which have remained constant for ages, and the historical development of the human mind in the infinite variety of the productions of science and art, and the progressive change of the modes of life. But the principle of this psychical organism, which comprises all these mental phenomena, is the free, self-conscious will contemplating its own nature. The human individual becomes a person by self-consciousness. It is the separation of the individual from itself, without which no specific mental process is possible. The individual which is an *Ego* is a person. The animal has no other value but as an exemplar of its species. Man acquires a substantive value by his capacity of becoming conscious of his nature. The concrete result of this self-consciousness is—knowing and willing. Self-consciousness, knowing, and willing, are inseparable mental processes; they condition each other, and are only realised by their uninterrupted connexion. Without self-consciousness there can be no knowledge and free will; knowing and willing are, on the other hand, the necessary results of self-consciousness. Man only, and not the brute, possesses the desire of knowledge. Self-consciousness becomes in the end self-knowledge. The mode of life of animals is still the same as described by Aristoteles. A history of animals does not exist, excepting that which refers to extinct animals. It is by new creations that a progress is effected in the animal world. A limited instinctive action cannot progress. Human liberty and the possibility of mental progress are inseparably connected. Even in the subordinate aspect of human life, the universality of human nature, and his independence of instinct, become apparent. Eating and drinking, clothing and habitation, seem natural wants. But man does not remain fixed by what is absolutely requisite. His desires, impulses, and inclinations are infinitely extended. Even in his luxuries, man exhibits his independence of instinct. The mode and manner in which he satisfies the natural wants, the vastness of his social intercourse, contribute to render natural life more humane and more spiritual. Thus, even eating and drinking are not without influence on mental development. There is no doubt that the law of historical development limits the liberty of the individual, in rendering him, to a considerable extent, dependent on the state of civilisation of his time and his people; but this liberty is only limited, not destroyed. The progress is always initiated by the individual who produces something new by his own energy, and which acquires an objective value; it becomes a contribution to the mental life of the species. It is in this productive participation in history that the liberty of man is exhibited as contradistinguished from the instinct of brutes. Man thus shows his individual substantiality, his peculiar mental endowment, not merely in accidental positions, but in the regular course of general development. (SCHALLER, *Body and Soul*.)

Extracts from Organon der Erkenntniss der Natur und des Geistes (Organon of the Knowledge of Nature and the Mind), by CARL GUSTAV CARUS (Leipzig, 1856; Brockhaus), *Origin of Language* (greatly abridged). When we inquire why abstraction is absent or

nearly impossible to an animal, the cause appears to be that animals do not possess the means by which any real abstract notion can be conceived and permanently retained. This means is no other but language. . . In proportion as the nervous system is more developed, and animals live a cerebral life, manifested by the possibility of dreaming (observed frequently in cage-birds and dogs), the animals become more sensible of their own feelings, and express them in tones and gestures which may be termed the language of sensation, which, however, always remains perfectly subjective. Such a language is also possessed by man. Thus the infant, yet unconscious of itself, expresses by sounds and motions, its indistinct feelings, but in proportion as *mental language* becomes developed, this physical language is displaced. The animal acquires, however, in particular instances the capacity to understand something of the mental language of man so as to obey and even mechanically to imitate articulate sounds. This, however, is far removed from the notion of a real or mental language which can never arise without the capacity of self-consciousness, and the latter is only developed in proportion as language is developed.

At first the mind searches for sounds for purely objective conceptions, and thus the nouns (substantiva) are formed; then the qualities (adjectiva) must be expressed; and, finally, the relations in which these notions stand to each other by time-words (verba). In the formation of the first, if the object manifests itself by noise, the sounds are imitated, such as the reverberations accompanying lightning. On the whole, the number of such words is not large, and they necessarily resemble each other in most languages. In all other cases the inventive spirit of man proceeds according to thousands of different analogies, so that every people chooses different words for the same object; hence the infinite variety of languages.

The expressions equivalent for pure abstract notions appear last in any people. In order to understand how imperfect and fragmentary we must assume the beginning of a language to have been, we must* examine the language of the savage or the development of speech in the child. The signs for the nearest and more important objects are first formed; mother, father, man, sun, moon, water, fire, etc. It is with such fragments that the savage and the child commences. Then are added the qualities, hot, cold, light, dark, soft, hard, green, heavy, light, etc. These are attached to the nouns: mother good, tree green, etc. Then come the sounds for actions, and it is remarkable how frequently (the languages of the native American tribes give evidence of this), connected actions are expressed in one simple word.

The designation for abstract notions come latest. It is only after the mind has acquired a great power over the designation of the higher abstract notions that it makes language itself an object, and begins not only to analyse and to determine the original sounds, but to give a form to language, *i. e.*, to lay the foundation for its grammar.*

* Every word is born as a whole in the mouth of man. It is only at a late

Man thus develops language out of himself, but it is language which reciprocally paves the way for the progress of the mind. Language may, in this sense, be said to produce thought. It is not without signification that in Greek *logos* has such a comprehensive meaning, and designates, besides word or discourse, also intellect, reason, and even a divine being—"In the beginning was the Word" (St. John).

All, in fact, what we term knowledge or science, is mainly conditioned by language. By language everything that is floating in the world is as it were sublimated and then fixed in words.

On Twins, &c. By Professor LEVY. According to statistical data there are—

| | Twinbirths. | | Triplets. |
|--------------------|-------------|---|-----------|
| England, one in 63 | - | - | 4311 |
| Germany „ 84 | - | - | 7182 |
| France „ 92 | - | - | 11105 |
| Denmark „ 78 | - | - | 4506 |

Besides climate, there are organic conditions which favour multiple conceptions. Thus the author saw in a Parisian Institute a woman who, in ten deliveries, had produced nineteen children. He observed the same disposition in women belonging to the same family. The physiological cause is the impregnation of several ova either simultaneously or at short intervals. The question has been discussed whether, in super-conceptions, the ova come from one ovary or from both ovaria. The author thinks that either may be the case, for he found in each ovary a corpus luteum, or two of them in the same ovary. That twins may proceed from the same ovary is proved by women having produced twins though one ovary was perfectly degenerated. Modern researches have also shewn that the second egg may be contained within a common Graafian follicle; even the same ovum may contain two germs. As a rule, each twin is enclosed by its own membranes, and the eggs, where they come into contact, are separated from each other by a septum. . . . In five cases the author found that each fœtus had its own amnion, but both were enclosed within the same chorion. In all cases where there was a common chorion the twins were of the same sex.

period that the understanding analyses the word into individual sounds—letters. It is one of the greatest errors in believing that, in investigating the origin of language, we must begin with individual letters.